Reengineered AC SERVOPACK

EGSV3 Series　CACR-***-EE*V**-00

User's Manual

YASKAWA

YASKAWA Electric Engineering Corporation

Contents

Revision No.5

Precautions

General Precautions
■ The drawings presented in this manual are sometimes shown without covers or protective guards. Always replace the cover or protective guard as specified first, and then operate the products in accordance with the manual. ■ The drawings presented in this manual are typical examples and may not match the product you received. ■ This manual is subject to change due to product improvement, specification modification, and manual improvement. When this manual is revised, the manual code is updated and the new manual is published as a next edition. The edition number appears on the back covers. ■ Yaskawa will not take responsibility for the results of unauthorized modifications of this product. Yaskawa shall not be liable for any damages or troubles resulting from unauthorized modification.

■ Safety Information

The following conventions are used to indicate precautions in this manual.
Failure to heed precautions provided in this manual can result in serious or possibly even fatal injury or damage to the products or to related equipment and systems.

WARNING Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.

CAUTION Indicates precautions that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.
In some situations, the precautions indicated could have serious consequences if not heeded.

PROHIBITED Indicates prohibited actions that must not be performed. For example, this symbol would be used to indicate that fire is prohibited as follows:

MANDATORY Indicates compulsory actions that must be performed. For example, this symbol would be used to indicate that grounding is compulsory as follows:

■Safety Precautions

This section describes important precautions that must be followed during storage, transportation, installation, wiring, operation, maintenance, inspection, and disposal. Be sure to always observe these precautions thoroughly.

WARNING

*Never touch any rotating motor parts while the motor is running.
Failure to observe this warning may result in injury.
*Before starting operation with a machine connected, make sure that an emergency stop can be applied at any time.
Failure to observe this warning may result in injury or damage to the product.
*Never touch the inside of the SERVOPACK s.
Failure to observe this warning may result in electric shock.
*Do not remove the cover of power supply terminal while the power is ON.
Failure to observe this warning may result in electric shock.
*Do not touch terminals for five minutes after the power is turned OFF.
Residual voltage may cause electric shock.
*Do not touch terminals while the charge indicator is lit.
Residual voltage may cause electric shock.
*Do not touch terminals for five minutes after voltage resistance test.
Residual voltage may cause electric shock.

WARNING

*Follow the procedures and instructions for the trial operation as noted in the applicable manual for that product.
Malfunctions that occur after the servomotor is connected to the equipment not only damage the equipment, but may also cause an accident resulting in death or injury.
*The output range of multi-turn data for CACR series absolute detection system differs from that for conventional systems (15-bit encoder and 12-bit encoder).
Especially when “Infinite length positioning system” of Σ series is to be configured with CACR series, be sure to make the system modification.
*The multi-turn limit value must be changed only for special applications.
Changing it inappropriately or unintentionally can be dangerous.
*If the Multi-turn Limit Disagreement alarm occurs, check the setting of parameter Pn205 in the SERVOPACK to be sure that it is correct.
If Fn013 is executed when an incorrect value is set in Pn205, an incorrect value will be set in the encoder. The alarm will disappear even if an incorrect value is set, but incorrect positions will be detected, resulting in a dangerous situation where the machine will move to unexpected positions.
*Do not remove the front cover, cables, connectors, or optional items on the foreside while the power is ON.
Failure to observe this warning may result in electric shock.
*Do not damage, press, exert excessive force or place heavy objects on the cables.
Failure to observe this warning may result in electric shock, stopping operation of the product, or fire.
*Do not modify the product.
Failure to observe this warning may result in injury, damage to the product, or fire.
*Provide an appropriate stopping device on the machine side to ensure safety.
A holding brake for a servomotor with brake is not a stopping device for ensuring safety.
Failure to observe this warning may result in injury.
*Do not come close to the machine immediately after resetting momentary power loss to avoid an unexpected restart.
Take appropriate measures to ensure safety against an unexpected restart.
Failure to observe this warning may result in injury.
*Connect the ground terminal to electrical codes (ground resistance: 100 Ω or less for a SERVOPACK with a 200 V/ 100 V power supply).
Improper grounding may result in electric shock or fire.
*Installation, disassembly, or repair must be performed only by authorized personnel.

■Storage and Transportation

CAUTION

* Do not store or install the product in the following places.
  ・ Locations subject to direct sunlight.
  ・ Locations subject to temperatures outside the range specified in the storage/installation temperature conditions.
  ・ Locations subject to humidity outside the range specified in the storage/installation humidity conditions.
  ・ Locations subject to condensation as the result of extreme changes in temperature.
  ・ Locations subject to corrosive or flammable gases.
  ・ Locations subject to dust, salts, or iron dust.
  ・ Locations subject to exposure to water, oil, or chemicals.
  ・ Locations subject to shock or vibration.

  Failure to observe this caution may result in fire, electric shock, or damage to the product.
* Do not hold the product by the cables, motor shaft, or detector while transporting it.
  Failure to observe this caution may result in injury or malfunction.
* Do not place any load exceeding the limit specified on the packing box.
  Failure to observe this caution may result in injury or malfunction.

CAUTION

* If disinfectants or insecticides must be used to treat packing materials such as wooden frames, pallets, or plywood, the packing materials must be treated before the product is packaged, and methods other than fumigation must be used.
  Example: Heat treatment, where materials are kiln-dried to a core temperature of 56 deg C/F for 30 minutes or more.
* If the electronic products, which include stand-alone products and products Installed in machines, are packed with fumigated wooden materials, the electrical components may be greatly damaged by the gases or fumes resulting from the fumigation process. In particular, disinfectants containing halogen, which includes chlorine, fluorine, bromine, or iodine, can contribute to the erosion of the capacitors.

■Installation

CAUTION

* Never use the products in an environment subject to water, corrosive gases, inflammable gases, or combustibles.
  Failure to observe this caution may result in electric shock or fire.
* Do not step on or place a heavy object on the product.
  Failure to observe this caution may result in injury or malfunction.
* Do not cover the inlet or outlet ports and prevent any foreign objects from entering the product.
  Failure to observe this caution may cause internal elements to deteriorate resulting in malfunction or fire.
* Be sure to install the product in the correct direction.
  Failure to observe this caution may result in malfunction.
* Provide the specified clearances between the SERVOPACK and the control panel or with other devices.
  Failure to observe this caution may result in fire or malfunction.
* Do not apply any strong impact.
  Failure to observe this caution may result in malfunction. An incorrect power supply may result in damage to the product.

■Wiring

CAUTION

* Be sure to wire correctly and securely.
  Failure to observe this caution may result in motor overrun, injury, or malfunction.
* Do not connect a commercial power supply to the U, V, or W servomotor connection terminals.
  Failure to observe this caution may result in injury or fire.
* Securely connect the power supply terminal screws and servomotor connection terminal screws.
  Failure to observe this caution may result in fire.
* Do not bundle or run the main circuit cables and input/output signal lines or the encoder cables together in the same duct. Keep power and signal lines separated by at least 30cm.
* Use twisted-pair shielded wires or multi-core twisted pair shielded wires for input/output signal lines and the encoder cables. The maximum length is 3 m for input/output signal lines and 20m for encoder cables.
* Do not touch the power terminals for 5 minutes after turning power OFF because high voltage may still remain in the SERVOPACK. Make sure the charge indicator is out first before wiring or starting an inspection.
* Observe the following precautions when wiring main circuit terminal blocks.
  ・ If the main circuit terminal is the connector, remove the connector from the SERVOPACK prior to wiring.
  ・ Insert only one wire per insertion slot on the terminal block and the connector.
  ・ Make sure that the core wire is not electrically shorted to adjacent core wires.
* Always use the specified power supply voltage. An incorrect voltage may result in fire.
* Take appropriate measures to ensure that the input power supply is supplied within the specified voltage fluctuation range. Be particularly careful in places where the power supply is unstable.

CAUTION

*Install external breakers or other safety devices against short-circuiting in external wiring.
  Failure to observe this caution may result in fire.
* Take appropriate and sufficient countermeasures for each when installing systems in the following locations.
  ・ Locations subject to static electricity or other forms of noise.
  ・ Locations subject to strong electromagnetic fields and magnetic fields.
  ・ Locations subject to possible exposure to radioactivity.
  ・ Locations close to power supplies.
  Failure to observe this caution may result in damage to the product.
* Do not reverse the polarity of the battery when connecting it.
  Failure to observe this caution may damage the battery, SERVOPACK, and servomotor or cause it to explode.
* Wiring or inspection must be performed by a technical expert.

■Operation

CAUTION

* Conduct trial operation on the servomotor alone with the motor shaft disconnected from machine to avoid any unexpected accidents.
  Failure to observe this caution may result in injury.
* Before starting operation with a machine connected, change the settings to match the parameters of the machine.
  Starting operation without matching the proper settings may cause the machine to run out of control or malfunction.
*Avoid frequently turning power ON and OFF. Since the SERVOPACK has a capacitor in the power supply, a high charging current flows when power is turned ON. Frequently turning power ON and OFF causes main power devices like capacitors and fuses to deteriorate, resulting in unexpected problems.
* Forced stop function with forward/reverse overtravel is not effective during JOG mode operation using utility function Fn002 and zero point search using Fn003.
* When using the servomotor for a vertical axis, install the safety devices to prevent work pieces to fall off due to occurrence of alarm or overtravel. Set the servomotor so that it will stop in the zero clamp state at occurrence of overtravel.
  Failure to observe this caution may cause work pieces to fall off due to overtravel.
* When not using the tuning-less function, set to the correct moment of inertia ratio Pn103. Setting to an incorrect moment of inertia ratio may cause vibration.
* Do not touch the SERVOPACK heatsinks, regenerative resistor, or servomotor while power is ON or soon after the power is turned OFF.
  Failure to observe this caution may result in burns due to high temperatures.
* Do not make any extreme adjustments or setting changes of parameters.
  Failure to observe this caution may result in injury or damage to the product due to unstable operation.
* When an alarm occurs, remove the cause, reset the alarm after confirming safety, and then resume operation.
  Failure to observe this caution may result in damage to the product, fire, or injury.
* Do not use the holding brake of the servomotor for braking.
  Failure to observe this caution may result in malfunction.
* Always use the servomotor and SERVOPACK in one of the specified combinations.
  Failure to observe this caution so may result in fire or malfunction.
* The servomotor stopping method of turning the main circuit or control-circuit power OFF without turning the servo OFF during operation can not be set in Parameter Pn001.
  ・ When turning the main-circuit power OFF without turning the servo OFF:
    The servomotor will be stopped by dynamic braking (DB).
  ・ When turning the control-circuit power OFF without turning the servo OFF:
    The stopping method will vary depending on the SERVOPACK model. Refer to the Σ -V Series User's Manual Design and Maintenance for details.
* Set the parameters of encoder selection PnF20, PnF40 according to the motor combination correctly .
  Starting operation without matching the proper settings may cause the machine to run out of control or malfunction.

■Maintenance and Inspection

CAUTION
* Do not disassemble the SERVOPACK. Failure to observe this caution may result in electric shock or injury. * Do not attempt to change wiring while the power is ON. Failure to observe this caution may result in electric shock or injury. * When replacing the SERVOPACK, resume operation only after transferring the previous SERVOPACK parameters to the new SERVOPACK. Failure to observe this caution may result in damage to the product.

■Disposal

CAUTION
* When disposing of the products, treat them as ordinary industrial waste.

■Warranty Information

Free Warranty Period

This product is warranted for twelve months after being delivered to Yaskawa's customer or if applicable eighteen months from the date of shipment from Yaskawa's factory whichever comes first.

Scope of Warranty

If a Yaskawa product is found to be defective due to Yaskawa workmanship or materials and the defect occurs during the warranty period, Yaskawa will provide a replacement, repair the defective product, and provide shipping to and from the site free of charge.

However, if the Yaskawa Authorized Service Center determines that the problem with a Yaskawa product is not due to defects in Yaskawa's workmanship or materials, then the customer will be responsible for the cost of any necessary repairs.

1. Outline

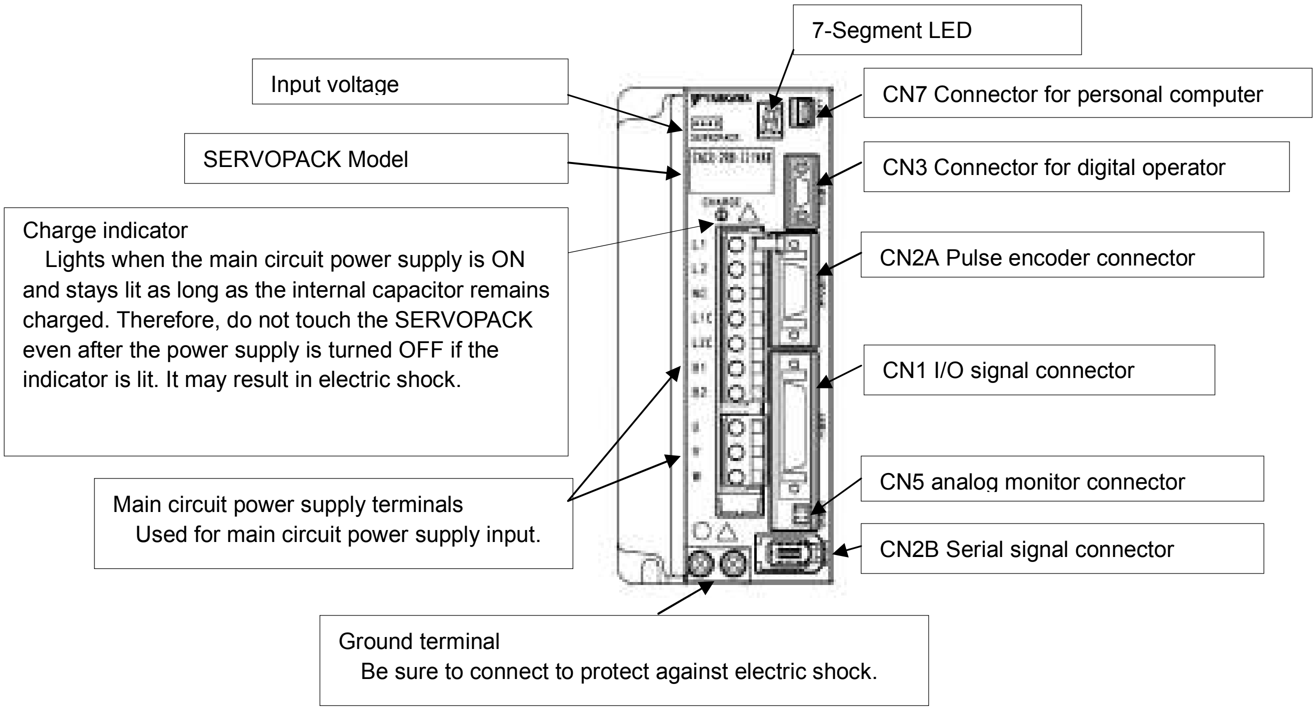
1.1. About EGSV3

EGSV3 is reengineered SERVOPACKs that is developed to substitute Sigama-1 SERVOPACKs.
And it’s applied with Σ-I motors.

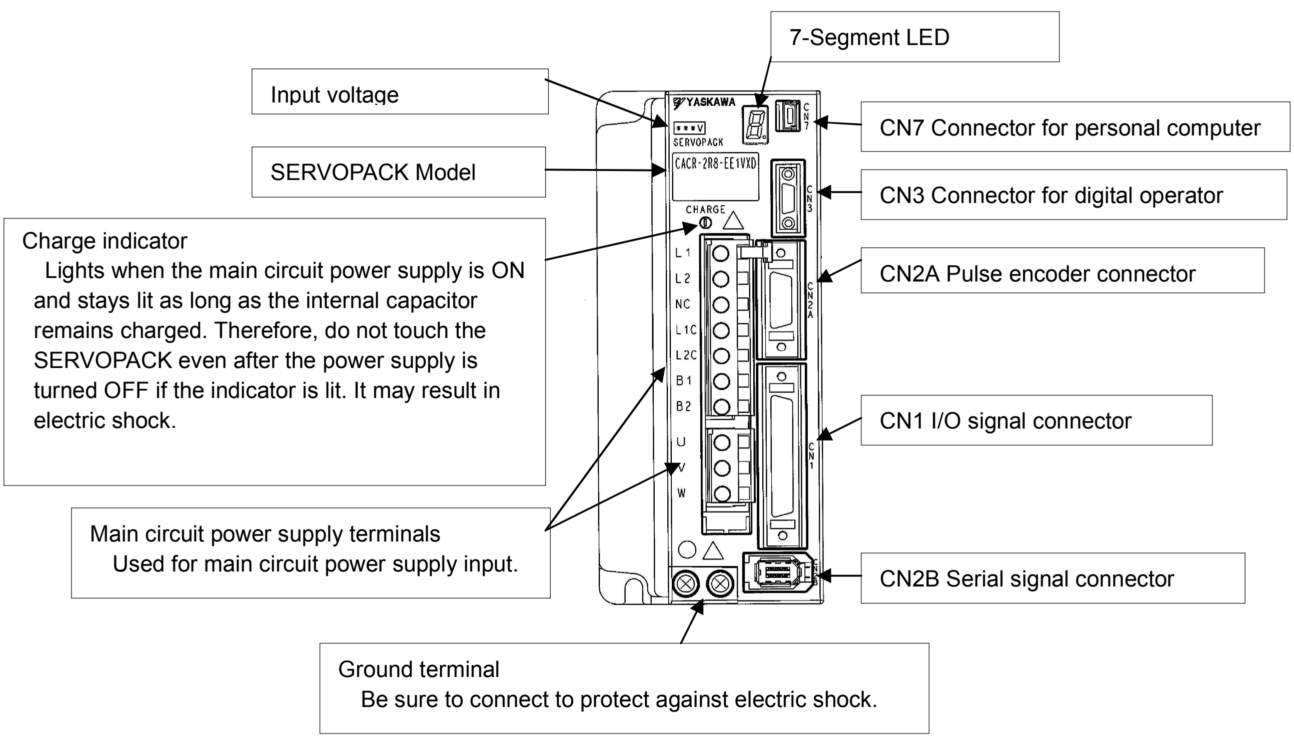
1.2. Parts Names

This section describes the part names of EGSV3 SERVOPACK

1.2.1. CACR-□□□-EE□VA□-00



1.2.2. CACR-□□□-EE□VBD-00



1.3. SERVOPACK Ratings and Specifications

1.3.1. Single-phase, 200-V Rating, 36-pin, CACR-***-EE1VAS-00, 50-pin CACR-***-EE1VBD-00

CACR-***	R44	R70	R90	2R1	2R8	5R5
Power	30W	50W	100W	200W	400W	750W
Continuous Output Current	0.44A	0.66A	0.91A	2.1A	2.8A	5.5A
Max. Output Current	1.3A	2.1A	2.9A	6.5A	9.3A	16.9A
Control Power Supply	Single-phase, 200 to 230 VAC , 50/60 Hz					
Main Circuit Power Supply	Single-phase, 200 to 230 VAC , 50/60 Hz					
Regenerative Resistor	External					Built-in 40W 50Ω
Minimum Allowable Resistance	40Ω					—
Approx. Mass	1.0 kg				1.2 kg	1.5 kg

(Note) EGDR-R01 (140W, 50Ω), which is the External Regenerative Resistor unit, is prepared as optional unit.
5R5 can not be connected to external regenerative resistor.

1.3.2. Single-phase, 100-V Rating, 36-pin, CACR-***-EE2VAS-00, 50-pin CACR-***-EE2VBD-00

CACR-***	R70	R90	2R1	2R8	5R5
Power	30W	50W	100W	200W	300W
Continuous Output Current	0.66A	0.91A	2.1A	2.8A	5.5A
Max. Output Current	2.1A	2.9A	6.5A	9.3A	16.9A
Control Power Supply	Single-phase, 100 to 110 VAC , 50/60 Hz				
Main Circuit Power Supply	Single-phase, 100 to 110 VAC , 50/60 Hz				
Regenerative Resistor	External				Built-in 40W 50Ω
Minimum Allowable Resistance	40Ω				—
Approx. Mass	1.0kg			1.2kg	1.5kg

(Note) EGDR-R01 (140W, 50Ω), which is the External Regenerative Resistor unit, is prepared as optional unit.
5R5 can not be connected to external regenerative resistor

1.3.3. Three-phase, 200-V Rating, 50-pin, CACR-***-EE1VBD-00

CACR-***	3R8	7R6	120	180	240	330	470	550	660	780
Power	500W	1kW	1.5kW	2kW	3kW	5kW	6kW	7.5kW	11kW	15kW
Continuous Output Current	3.8A	7.6A	11.6A	18.5A	24.8A	32.9A	46.9A	54.7A	58.6A	78.0A
Max. Output Current	11A	17A	28A	42A	56A	84A	110A	130A	140A	170A
Control Power Supply	Single-phase, 200 to 230 VAC , 50/60 Hz									
Main Circuit Power Supply	Three-phase, 200 to 230 VAC , 50/60 Hz									
Regenerative Resistor	Built-in (Note1)						External (Note.2)			
	40W 50Ω		80W 12Ω			180W 8Ω	6.25Ω	3.13Ω		
Minimum Allowable Resistance	—		12Ω			8Ω	6.25Ω	3.13Ω		
Approx. Mass	1.5kg		2.8kg			4.6kg	10.2kg		21.3kg	

(Note1): EGDR-R02 (140W, 12.5Ω) and EGDR-R03 (280W, 8Ω), which are the External Regenerative Resistor unit, are prepared as optional units.
3R8 and 7R6 can not be connected to external regenerative resistor.
(Note2): CACR-470, 550, 660, and 780 need external regenerative resistor.
JUSP-RA04-E (880W 6.25Ω) for CACR-470 and JUSP-RA05-E (1760W 3.13Ω) for CACR-550, 660, and 780 are prepared by Yaskawa.

1.3.4. Basic Specifications

Item	Specification
Drive Method	Sine-wave current drive with PWM control of IGBT
Feedback	Incremental Encoder: 8192,2048 Absolute Encoder : 15bit, 12bit Note3)
Surrounding Air Temperature	0°C to +55°C
Storage Temperature	-20°C to +85°C
Ambient Humidity	90% RH or less (With no freezing or condensation)
Storage Humidity	90% RH or less (With no freezing or condensation)
Vibration Resistance	$4.9 m/s^2$
Shock Resistance	$19.6 m/s^2$
Altitude	1000 m or less
Dynamic Brake (DB)	Activated when a servo alarm occurs or when the power supply for the main circuit is OFF or when servomotor is OFF.
Protective Function	Over current, overvoltage, insufficient voltage, overload, regeneration error, Over speed, run away, Heat Sink Overheated, encoder error, CPU error
Display	Charge indication, 7-seg LED
Pulse signal input Sign signal input	Line driver and Open Collector 1Mpps/200Kpps (note1)
Clear signal input	Line driver and Open Collector (note1)
Speed reference input	Max. input voltage: ±10 V Speed Control Range 1:5000 (note2)
Torque reference input	Max. input voltage: ±10 V (note2)
/S-ON input signal /P-CON input signal /P-OT 入力 input signal /N-OT input signal /P-CL input signal /N-CL input signal /ALM-RST input signal	photo coupler input
ALM output signal S-RDY output signal TG-ON output signal COIN output signal	photo coupler output: Max. input voltage DC30V Max. input current DC50mA ＊S-RDY signal is only prepared on CACR-***-EE1VBD-00 (50PIN analog/Pulse reference) ＊COIN signal is not prepared on CACR-***-EE1VAS-00 (36PIN analog reference)
Alarm code output signal	Open Collector output: MAX. voltage DC30V Max. output current DC20mA
Encoder divide output pulse	Phase-A,B,C Line driver output (SN75ALS174 or equivalent)
Analog monitor 1 output	Torque reference monitor 1V/100% Max. output ±8V 10mA accuracy ±20mV
Analog monitor 2 output	Speed monitor 1V/1000r/min-1 Max. output ±8V 10mA accuracy ±20mV
Communication	RS422A
USB Communication	Complies with standard USB1.1.
Digital operator	JUSP-OP05A-1-E
Mounting	Base mount

(Note1): No function on CACR-□□□-EE□VAS-00 (36PIN analog reference model)
(Note2): No function on CACR-□□□-EE□VAP-00 (36PIN pulse reference model)
(Note3): The absolute encoder can not be connected to CACR-□□□-EE□VAP-00 (36PIN pulse reference model)

2. SERVOPACK Model Designation

CACR - *** - EE * V B D - 00

Custom-made (00)
- 00 : Standard

Reference method (D)
- D : Analog/Pulse reference
- S : Analog reference
- P : Pulse reference

I/O connector and PG specification (B)
- A : CN1 36PIN Incremental/Absolute
- B : CN1 50PIN Incremental/Absolute

Series (V)
- V : Σ-V

Input Voltage specification (*)
- 1 : AC200V
- 2 : AC100V

Model for Yaskawa engineering EGSV3 (EE)

Power range (Current indication) (***)
- R44 : 30W(200V)
- R70 : 50W(200V),30W(100V)
- R90 : 100W(200V),50W(100V)
- 2R1 : 200W(200V),100W(100V)
- 2R8 : 400W(200V),200W(100V)
- 3R8 : 500W(200V)
- 5R5 : 750W(200V),300W(100V)
- 7R6 : 1kW(200V)
- 120 : 1.5KW(200V)
- 180 : 2kW(200V)
- 240 : 3kW(200V)
- 330 : 5kW(200V)
- 470=6kW(200V)
- 550=7.5kW(200V)
- 660=11kW(200V)
- 780=15kW(200V)

AC SERVOPACK (CACR)

3. SERVOPACK Selection

Group	old model	Reengineered model	External dimensions (Note3)	Attachment: Terminal Change	Attachment: Mounting Plate	Attachment: Connector Change	Attachment: External dimensions	External Regenerative resistor unit
SGDA Speed control 100v	SGDA-A3BS	CACR-R70-EE2VAS-00	5.1.1 A(36)	EGDR-AT01	EGDR-BS01	Not Required	10.2.1	EGDR-R01
	SGDA-A5BS	CACR-R90-EE2VAS-00						
	SGDA-01BS	CACR-2R1-EE2VAS-00						
	SGDA-02BS	CACR-2R8-EE2VAS-00	5.2.1 B(36)		EGDR-BS02		10.2.2	
	SGDA-03BS	CACR-5R5-EE2VAS-00	5.3.1 C(36)		EGDR-BS03		10.2.3	No option
SGDA Speed control 200v	SGDA-A3AS	CACR-R44-EE1VAS-00	5.1.1 A(36)		EGDR-BS01		10.2.1	EGDR-R01
	SGDA-A5AS	CACR-R70-EE1VAS-00						
	SGDA-01AS	CACR-R90-EE1VAS-00						
	SGDA-02AS	CACR-2R1-EE1VAS-00						
	SGDA-04AS	CACR-2R8-EE1VAS-00	5.2.1 B(36)		EGDR-BS02		10.2.2	
	SGDA-08AS	CACR-5R5-EE1VAS-00	5.3.1 C(36)		EGDR-BS03		10.2.3	No option
SGDA Position control 100v	SGDA-A3BP	CACR-R70-EE2VAP-00	5.1.1 A(36)		EGDR-BS01		10.2.1	EGDR-R01
	SGDA-A5BP	CACR-R90-EE2VAP-00						
	SGDA-01BP	CACR-2R1-EE2VAP-00						
	SGDA-02BP	CACR-2R8-EE2VAP-00	5.2.1 B(36)		EGDR-BS02		10.2.2	
	SGDA-03BP	CACR-5R5-EE2VAP-00	5.3.1 C(36)		EGDR-BS03		10.2.3	No option
SGDA Position Control 200v	SGDA-A3AP	CACR-R44-EE1VAP-00	5.1.1 A(36)		EGDR-BS01		10.2.1	EGDR-R01
	SGDA-A5AP	CACR-R70-EE1VAP-00						
	SGDA-01AP	CACR-R90-EE1VAP-00						
	SGDA-02AP	CACR-2R1-EE1VAP-00						
	SGDA-04AP	CACR-2R8-EE1VAP-00	5.2.1 B(36)		EGDR-BS02		10.2.2	
	SGDA-08AP	CACR-5R5-EE1VAP-00	5.3.1 C(36)		EGDR-BS03		10.2.3	No option
DR2 100v	DR2-A3BC	CACR-R70-EE2VBD-00	5.1.2 A(50)	No Option	EGDR-SYL04	EGDR-CBL04 EGDR-CBL05	10.2.9	EGDR-R01
	DR2-A5BC	CACR-R90-EE2VBD-00						
	DR2-01BC	CACR-2R1-EE2VBD-00						
	DR2-02BC	CACR-2R8-EE2VBD-00	5.2.2 B(50)		EGDR-SYL01		10.2.10	
	DR2-03BC	CACR-5R5-EE2VBD-00	5.3.2 C(50)				10.2.11	No option
DR2 200v	DR2-A3AC	CACR-R44-EE1VBD-00	5.1.2 A(50)		EGDR-SYL04		10.2.9	EGDR-R01
	DR2-A5AC	CACR-R70-EE1VBD-00						
	DR2-01AC	CACR-R90-EE1VBD-00						
	DR2-02AC	CACR-2R1-EE1VBD-00						
	DR2-04AC	CACR-2R8-EE1VBD-00	5.2.2 B(50)		EGDR-SYL01		10.2.10	
	DR2-08AC	CACR-5R5-EE1VBD-00	5.3.2 C(50)				10.2.11	No option
SGDB 200V	SGDB-03ADM	CACR-3R8-EE1VBD-00	5.3.2 C(50)	EGDR-AT02A	EGDR-BS04	Not Required	10.2.4	
	SGDB-05AD* (Note1)							
	SGDB-07ADM	CACR-7R6-EE1VBD-00						
	SGDB-10AD* (Note1)							
	SGDB-15AD* (Note1)	CACR-120-EE1VBD-00	5.4 D	EGDR-AT02B			10.2.5	EGDR-R02
	SGDB-20AD* (Note1)	CACR-180-EE1VBD-00			EGDR-BS05		10.2.6	
	SGDB-30AD* (Note1)	CACR-240-EE1VBD-00						
	SGDB-44AD* (Note1)	CACR-330-EE1VBD-00	5.5 E	EGDR-AT03	EGDR-BS06		10.2.7	EGDR-R03
	SGDB-50AD* (Note1)							
	SGDB-60AD* (Note1)	CACR-470-EE1VBD-00	5.6 F	Not Required	EGDR-BS07		10.2.8	JUSP-RA04-E (Note2)
	SGDB-75ADG	CACR-550-EE1VBD-00						JUSP-RA05-E (Note2)
	SGDB-1AADG	CACR-660-EE1VBD-00	5.7 G	Not Required				
	SGDB-1EADG	CACR-780-EE1VBD-00						

(Note1) : Symbol "*" is set character G, M, S, D, P depend on motor model.
(Note2) : External regenerative resistor must be needed. Other model needs regenerative resistor case by case
(Note3) : This column shows a chapter number placing external dimensions.

4. Wiring and Connection

4.1. Main Circuit Wiring

4.1.1. Names and function of the main circuit terminals

(1) CACR-R44-EE□V□□-00, CACR-R70-EE□V□□-00, CACR-R90-EE□V□□-00, CACR-2R1-EE□V□□-00, CACR-2R8-EE□V□□-00

Connection	Name	Terminal Symbols	Function
Connector 1	Main circuit power input terminals	L1,L2,L3	Single-phase main power input (No connection on L3 terminal)
	Control power input Terminals	L1C,L2C	Single-phase control power input
	External regenerative resistor connection terminals	B1,B2	Built-in regenerative resistor is not in SERVOPACKs. If the regenerative capacity is insufficient, connect an external regenerative resistor between B1 and B2. Note: The external regenerative resistor is not included.
Connector 2	Servomotor connection terminals	U,V,W	Use for connecting to the servomotor.
Ground	Ground terminals (×2)	⏚	Use for connecting the power supply ground terminal and servomotor ground terminal. (M4 screw)

(2) CACR-5R5-EE□V□□-00

Connection	Name	Terminal Symbols	Function
Connector 1	Main circuit power input terminals	L1,L2,L3	Single-phase main power input (No connection on L3 terminal)
	Control power input Terminals	L1C,L2C	Single-phase control power input
	External regenerative resistor connection terminals	B1,B2	Built-in regenerative resistor is connected on this terminal. External regenerative resistor can not be connected to this terminal.
Connector 2	Servomotor connection terminals	U,V,W	Use for connecting to the servomotor.
Ground	Ground terminals (×2)	⏚	Use for connecting the power supply ground terminal and servomotor ground terminal. (M4 screw)

(3) CACR-3R8-EE1VBD-00, CACR-7R6-EE1VBD-00

Connection	Name	Terminal Symbols	Function
Connector 1	Main circuit power input terminals	L1,L2,L3	Three-phase main power input
	Control power input Terminals	L1C,L2C	Single-phase control power input
	External regenerative resistor connection terminals	B1,B2	Built-in regenerative resistor is connected on this terminal. External regenerative resistor can not be connected to this terminal.
Connector 2	Servomotor connection terminals	U,V,W	Use for connecting to the servomotor.
Ground	Ground terminals (×2)	⏚	Use for connecting the power supply ground terminal and servomotor ground terminal. (M4 screw)

Main circuit power input terminal, which is mentioned above 3 tables, is connector type.

Cable-end Connector	Model	Manufacturer
Connector 1	721-207/026-000	WAGO Japan
Connector 2	721-203/026-000	WAGO Japan

(4) CACR-120-EE1VBD-00, CACR-180-EE1VBD-00, CACR-240-EE1VBD-00, CACR-330-EE1VBD-00

Name	Terminal Symbols	Function
Main circuit power input terminals	L1,L2,L3	Three-phase main power input
Control power input terminals	L1C,L2C	Single-phase control power input
External regenerative resistor connection terminals	B1/(+),B2	If the regenerative capacity is insufficient, connect an external regenerative resistor between B1/ and B2. Note: The external regenerative resistor is not included.
Mounted inside regenerative resistor	B3	Internal regenerative resistor is connected between B1 and (+) And Between B2 and B3, it is short-circuited when the SERVOPACK is shipped from the factory
DC reactor connection terminal for power supply harmonic suppression	(-)1, (-)2	If a countermeasure against power supply harmonic waves is needed, connect a DC reactor between 1 and 2. And Between (-)1 and (-)2, it is short-circuited when the SERVOPACK is shipped from the factory
Servomotor connection terminals	U,V,W	Use for connecting to the servomotor.
Ground terminals (×2)	⏚	Use for connecting the power supply ground terminal and servomotor ground terminal. (M4 screw)

All terminals are with M4 screw.

(5) CACR-470-EE1VBD-00, CACR-550-EE1VBD-00, CACR-660-EE1VBD-00, CACR-780-EE1VBD-00,

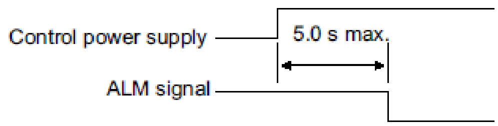
Name	Terminal Symbols	Function
Main circuit power input terminals	L1,L2,L3	Three-phase main power input
Control power input terminals	L1C,L2C	Single-phase control power input
External regenerative resistor connection terminals	B1/(+),B2	External regenerative resistor must be connected to this terminal.
Main circuit negative terminal	(-)	Use when DC power supply input is used. And it's minus input terminal.
Servomotor connection terminals	U,V,W	Use for connecting to the servomotor.
Ground terminals (×2)	⏚	Use for connecting the power supply ground terminal and servomotor ground terminal. (M4 screw)

All terminals are with M6 screw.

4. 1. 2. Typical Main Circuit Wiring Examples

Note the following points when designing the power ON sequence.

• Design the power ON sequence so that main power is turned OFF when a servo alarm signal (ALM) is output.
• The ALM signal is output for a maximum of five seconds when the control power is turned ON. Take this into consideration when designing the power ON sequence. Design the sequence so the ALM signal is activated and the alarm detection relay (1Ry) is turned OFF to stop the main circuit's power supply to the SERVOPACK.



• Select the power supply specifications for the parts in accordance with the input power supply.

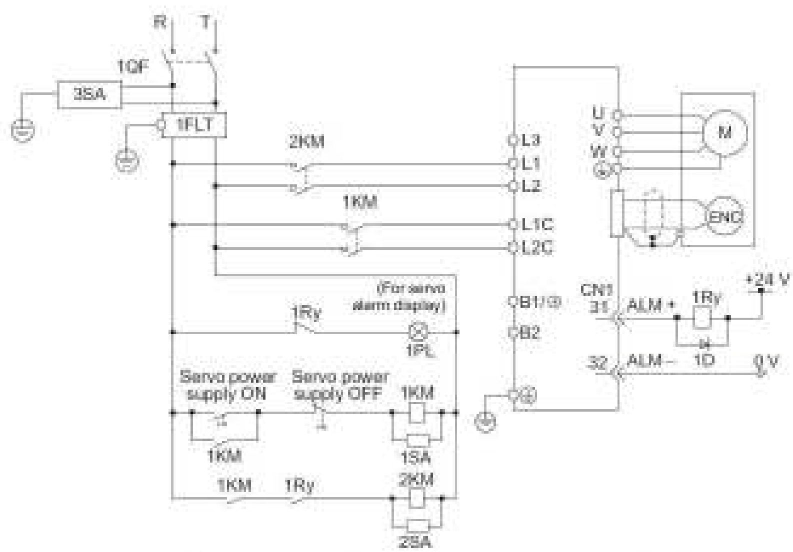
IMPORTANT	• When turning ON the control power supply and the main circuit power supply, turn them ON at the same time or turn the main circuit power supply after the control power supply. When turning OFF the power supplies, first turn the power for the main circuit OFF and then turn OFF the control power supply.

The typical main circuit wiring examples are shown below.

⚠ WARNING
• Do not touch the power supply terminals after turning OFF the power. High voltage may still remain in the SERVOPACK, resulting in electric shock. When the voltage is discharged, the charge indicator will turn OFF. Make sure the charge indicator is OFF before starting wiring or inspections.

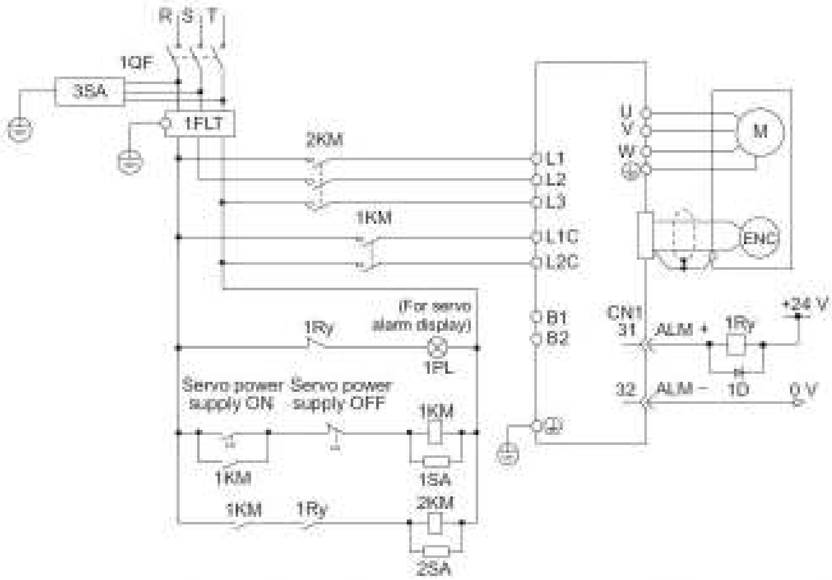
(1) CACR-R70-EE*V**-00, CACR-R90-EE*V**-00, CACR-2R1-EE*V**-00, CACR-2R8-EE*V**-00, CACR-5R5-EE*V**-00 (Single phase 100V and 200V)

(Note) Terminal L3 is not used for single phase connection.



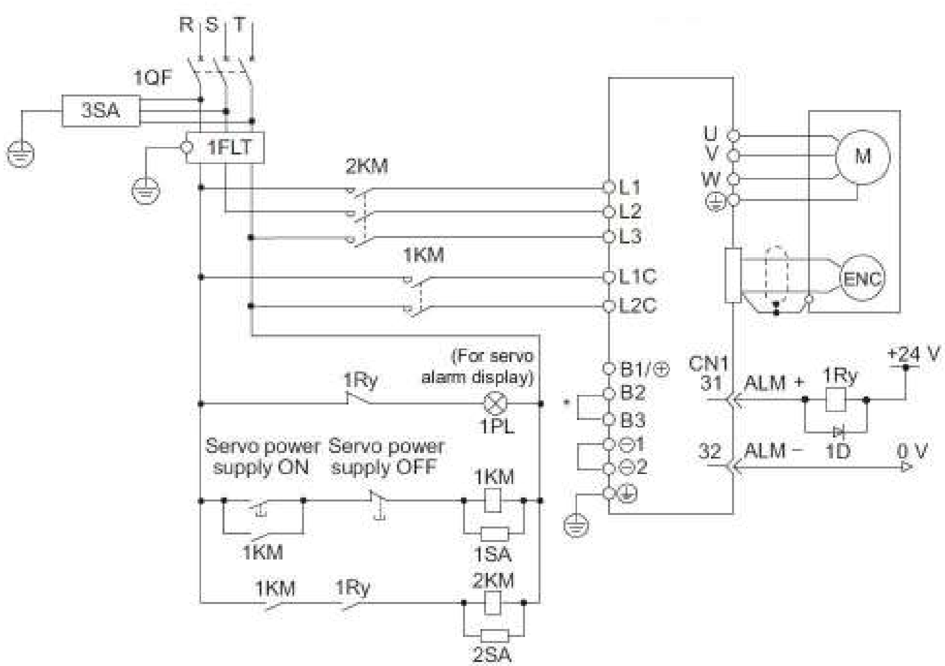
1QF: Molded-case circuit breaker
1FLT: Noise filter
1KM: Magnetic contactor (for control power supply)
2KM: Magnetic contactor (for main circuit power supply)
1Ry: Relay
1PL: Indicator lamp
1SA: Surge absorber
2SA: Surge absorber
3SA: Surge absorber
1D: Flywheel diode

(2) CACR-3R8-EE1VBD-00, CACR-7R6-EE1VBD-00 (Three phase 200V)



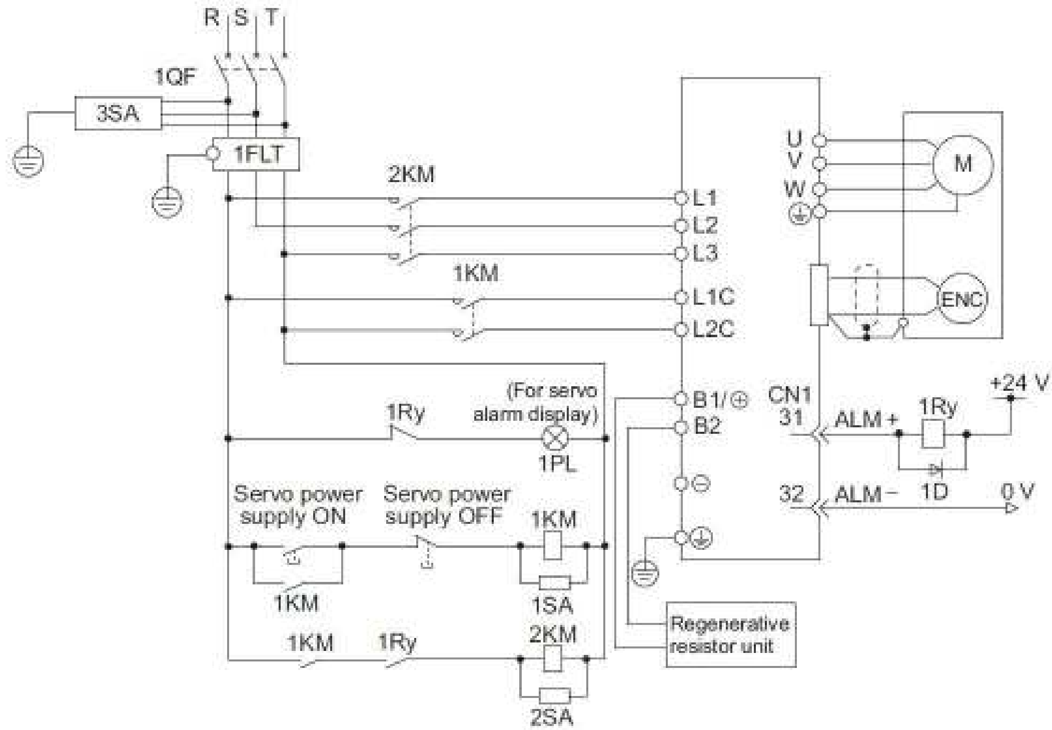
1QF: Molded-case circuit breaker
1FLT: Noise filter
1KM: Magnetic contactor (for control power supply)
2KM: Magnetic contactor (for main circuit power supply)
1Ry: Relay
1PL: Indicator lamp
1SA: Surge absorber
2SA: Surge absorber
3SA: Surge absorber
1D: Flywheel diode

(3) CACR-120-EE1VBD-00, CACR-180-EE1VBD-00, CACR-240-EE1VBD-00, CACR-330-EE1VBD-00 (Three phase 200V)



1QF: Molded-case circuit breaker
1FLT: Noise filter
1KM: Magnetic contactor (for control power supply)
2KM: Magnetic contactor (for main circuit power supply)
1Ry: Relay
1PL: Indicator lamp
1SA: Surge absorber
2SA: Surge absorber
3SA: Surge absorber
1D: Flywheel diode

(4) CACR-470-EE1VBD-00, CACR-550-EE1VBD-00, CACR-660-EE1VBD-00, CACR-780-EE1VBD-00
(Three phase 200V)



1QF: Molded-case circuit breaker
1FLT: Noise filter
1KM: Magnetic contactor (for control power supply)
2KM: Magnetic contactor (for main circuit power supply)
1Ry: Relay
1PL: Indicator lamp
1SA: Surge absorber
2SA: Surge absorber
3SA: Surge absorber
1D: Flywheel diode

4.2. I/O Signal Connections

4.2.1. I/O Signal (CN1) Names and Functions

(1) Input Signals

Control Method	Signal Name	Pin No. 50pin model VBD	36pin model VAS	36pin model VAP	Function
Common	/S-ON	40	14	14	Servo ON/OFF: Turns ON/OFF the servomotor.
	/P-CON	41	15	15	Switches the speed control loop from PI (proportional/ integral) to P (proportional) control when ON. Change other function by parameter setting
	P-OT N-OT	42 43	16 17	16 17	With overtravel prevention: Stops servomotor when movable part travels beyond the allowable range of motion.
	/P-CL /N-CL	45 46	11 12	11 12	Activates/deactivates external torque limit function. With internal set speed control selected: Switches the internal set speed settings.
	/ALM-RST	44	18	18	Alarm reset: Releases the servo alarm state.
	+24VIN	47	13	13	Control power supply input for sequence signals.
	SEN	4	5	-	Initial data request signal when using an absolute encoder.
	BAT+ BAT-	21 22	28 29	28 29	Connecting pin for the absolute encoder backup battery. Do not connect when the encoder cable with the battery case is used.
Speed	V-REF	5	3	-	Inputs analog voltage as speed reference.
Torque	T-REF	9	1	-	Inputs analog voltage as torque reference.
Position	PULS /PULS SIGN /SIGN	7 8 11 12	- - - -	1 2 3 4	Input pulse signal for positioning control
	CLR /CLR	15 14	- -	5 6	Clears position error during position control.

(2) Output Signals

Control Method	Signal Name	Pin No. 50pin model VBD	36pin model VAS	36pin model VAP	Function
common	ALM+ ALM-	31 32	34 35	34 35	Servo alarm: Turns OFF when an error is detected.
	/TGON+ /TGON-	27 28	9 10	9 10	Detection during servomotor rotation: Turns ON when the servomotor is rotating at a speed higher than the motor speed setting.
	/S-RDY+ /S-RDY-	29 30	- -	- -	Servo ready: Turns ON when the SERVOPACK is ready to accept the servo ON (/S-ON) signal. Can be selected BK signal by parameter setting
	/BK SG-COM	-	7 10	7 10	Holding brake control signal
	PAO /PAO	33 34	20 21	20 21	Phase-A signal
	PBO /PBO	35 36	22 23	22 23	Phase-B signal
	PCO /PCO	19 20	24 25	24 25	Phase-C signal
	PSO /PSO	48 49	26 27	26 27	Phase-S signal
	AL01 AL02 AL03	37 38 39	30 31 32	30 31 32	Alarm code output: Outputs 3-bit alarm codes.
	FG	50	36	36	Frame ground
speed	/V-CMP	-	8	-	Speed coincidence output
	+12V -12V	23 24	- -	- -	Power supply for analog reference

Control Method	Signal Name	Pin No. 50pin model VBD	Pin No. 36pin model VAS	Pin No. 36pin model VAP	Function
Position	/COIN+ /COIN-	25 26	- -	8 10	If position control is selected, the signal turns ON when the number of position error reaches the value set.
	PL1 PL2 PL3	3 13 18	- - -	- - -	Output signals of power supply for open-collector reference
Monitor	MON1 MON2	16 17	- -	- -	Analog monitor signal. MON1: Torque reference monitor MON2: Speed monitor (Note) Analog monitor is allocated CN5 in case 36 pin connector

4.2.2. 1CN Terminal Layout

4.2.2.1. 50pin Terminal layout: CACR-□□□-EE1VBD-00 CACR-□□□-EE2VBD-00

Pin	Signal	Function
2	SG	GND
4	SEN	SEN Signal input
6	SG	GND
8	/PLUS	Pulse reference input
10	SG	GND
12	/SIGN	Sign reference input
14	/CLR	Clear input
16	MON1	Analog monitor 1
18	PL3	Power supply for open-collector
20	/PCO	PG C-phase output
22	BAT-	Battery -
24	-12V	Power supply for analog reference

Pin	Signal	Function
1	SG	GND
3	PL1	Power supply for open-collector
5	V-REF	Speed reference input
7	PLUS	Pulse reference input
9	T-REF	Torque reference input
11	SIGN	Sign reference input
13	PL2	Power supply for open-collector
15	CLR	Clear input
17	MON2	Analog monitor 2
19	PCO	PG C-phase output
21	BAT+	Battery +
23	+12V	+ Power supply for analog reference
25	/COIN +	Speed coincidence output

Pin	Signal	Function
27	/TGON +	TGON signal output
29	/S-RDY +	Servo ready signal output
31	ALM+	Servo alarm output
33	PAO	PG A-phase output
35	PBO	PG B-phase output
37	AL01	Alarm code Output
39	AL03	Alarm code Output
41	/P-CON	P control input
43	/N-OT	Reverse rotation prohibited
45	/P-CL	Forward torque limit ON input
47	+24V-IN	External power supply input
49	/PSO	PG S-phase output

Pin	Signal	Function
26	/COIN-	Speed coincidence output
28	/TGON-	TGON signal output
30	/S-RDY-	Servo ready signal output
32	ALM-	Servo alarm output
34	/PAO	PG A-phase output
36	/PBO	PG B-phase output
38	AL02	Alarm code Output
40	/S-ON	Servo ON input
42	/P-OT	Forward rotation Inhibited
44	/ALM-RST	Alarm reset input
46	/N-CL	Reverse torque limit ON input
48	PSO	PG S-phase output
50	FG	Frame ground

CN1 cable with connector for 50pin

Model name (supplied by Yaskawa)	Case Model	Case Qty	Connector Model	Connector Qty.	Manufacturer
JZSP-CSI9-1-E	10350-52Z0-008	1	10150-3000PE (soldering model	1	Sumitomo 3M Limited

4.2.2.2. 36pin Terminal layout: CACR-□□□-EE1VAS-00, CACR-□□□-EE2VAS-00

Analog speed reference model

2	SG	GND	1	T-REF	Torque reference input	20	PAO	PG A-phase output	19	SG	GND
4	SG	GND	3	V-REF	Speed reference input	22	PBO	PG B-phase output	21	/PAO	PG A-phase output
6	0SEN	SEN signal input	5	SEN	SEN signal input	24	PCO	PG C-phase output	23	/PBO	PG B-phase output
8	/V-CMP	Speed coincidence output	7	/BK	Brake interlock signal output	26	PSO	PG S-phase output	25	/PCO	PG C-phase output
10	SG-COM	BK/V-CMP/ TGON common 0 V	9	/TGON-	TGON signal output	28	BAT+	Battery +	27	/PSO	PG S-phase output
12	/N-CL	Reverse torque limit ON input	11	/P-CL	Forward torque limit ON input	30	AL01	Alarm code output	29	/BAT-	Battery -
14	/S-ON	Servo ON input	13	+24V-IN	External power supply input	32	AL03	Alarm code output	31	AL02	Alarm code Output
16	P-OT	Forward rotation Inhibited	15	/P-CON	P control input	34	ALM+	Servo alarm output	33	SG-AL	Alarm code output common 0V
18	/ALM-RST	Alarm reset input	17	N-OT	Reverse rota-tion prohibited	36	FG	Frame ground	35	ALM-	Servo alarm Output

4.2.2.3. 36 pin Terminal layout : CACR-□□□-EE1VAP-00, CACR-□□□-EE2VAP-00

Pulse reference model

2	/PLUS	Pulse reference input	1	PULS	Pulse reference input	20	PAO	PG A-phase output	19	SG	GND
4	/SIGN	Sign reference input	3	SIGN	Sign reference input	22	PBO	PG B-phase output	21	/PAO	PG A-phase output
6	/CLR	Clear input	5	CLR	Clear input	24	PCO	PG C-phase output	23	/PBO	PG B-phase output
8	/COIN	Speed coincidence output	7	/BK	Brake interlock signal output	26	PSO	PG S-phase output	25	/PCO	PG C-phase output
10	SG-COM	BK/V-CMP/ TGON common 0 V	9	/TGON-	GON signal output	28	BAT+	Battery +	27	/PSO	PG S-phase output
12	/N-CL	Reverse torque limit ON input	11	/P-CL	Forward torque limit ON input	30	AL01	Alarm code output	29	/BAT-	Battery -
14	/S-ON	Servo ON input	13	+24V-IN	External power supply input	32	AL03	Alarm code output	31	AL02	Alarm code Output
16	P-OT	Forward rotation Inhibited	15	/P-CON	P control input	34	ALM+	Servo alarm output	33	SG-AL	Alarm code output
18	/ALM-RST	Alarm reset input	17	N-OT	Reverse rota-tion prohibited	36	FG	Frame ground	35	ALM-	Servo alarm Output

CN1 cable with connector for 36pin

Case		Connector		Manufacturer
Model	Qty.	Model	Qty.	
10336-52A0-008	1 kit	10136-3000PE (soldering model)	1	Sumitomo 3M Limited

4.2.3. CN2A Pulse encoder connector (for Incremental encoder and absolute encoder)

CN2A layout

2	SG	GND	1	SG	GND	12	BAT+	Battery + output	11	--	--
4	PG5V	+5VPower supply	3	SG	GND	14	PC	PG C-phase input	13	BAT-	Battery - output
6	PG5V	+5VPower supply	5	PG5V	+5VPower supply	16	PA	PG A-phase input	15	/PC	PG C-phase input
8	PS	PG S-phase input	7	DIR	Rotate direction change	18	PB	PG B-phase input	17	/PA	PG A-phase input
10	--	--	9	/PS	PG S-phase input	20	FG	Frame ground	19	/PB	PG B-phase input

CN2A cable with connector

Case		Connector		Manufacturer
Model	Qty.	Model	Qty.	
10320-52A0-008	1	10120-3000PE (soldering model)	1	Sumitomo 3M Limited

4.2.4. CN2B (Serial signal connector)

Connection is unnecessary.

4.2.5. CN3 (for digital operator)

This connector is for digital operator JUSP-OP05A-1-E.

4.2.6. CN5 (Analog monitors connector)

This connector is for monitor connector only in CACR-***-EE1VA*-00, CACR-□□□-EE2VA*-00 (36pin model), and connected to measuring equipment through cable JZSP-CA01-E.

Pin No.	Cable color	Signal name	Specification
1	White	Analog monitor 1	Torque reference: 0.88V/rating torque (Default setting)
2	Red	Analog monitor 2	Motor speed monitor:0.5V/1000min^{-1} (Default setting)
3	black	GND	Analog monitor 0V
4	black	GND	Analog monitor 0V

4.2.7. CN7 USB Port

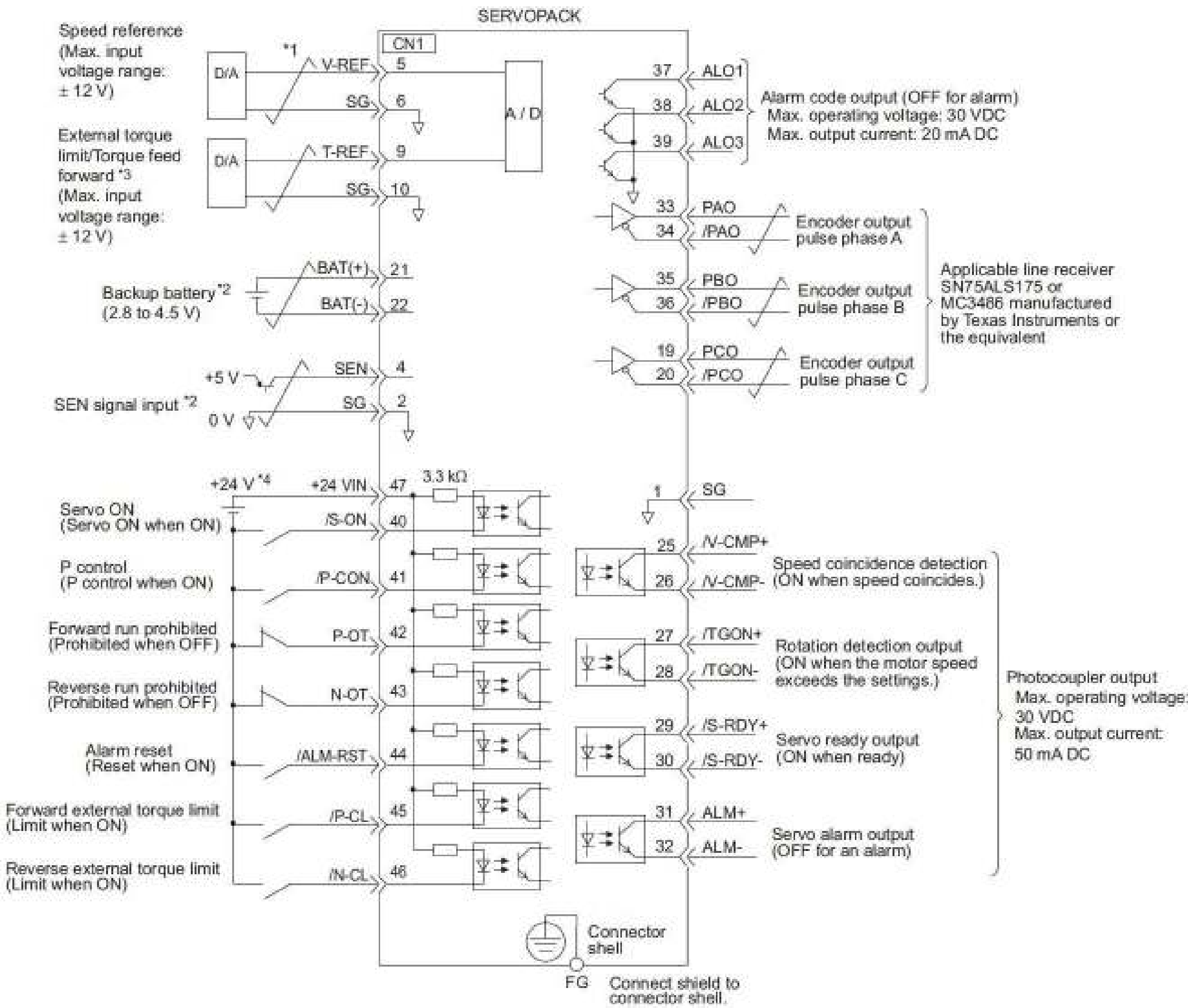
It's for PC and follows the USB1.1 standard.

4.3. Signal Connection Example

4.3.1. Speed control Example

CACR-***-EE*VBD-00 (50PIN analog/pulse reference)

Connection example in speed control is as shown below.



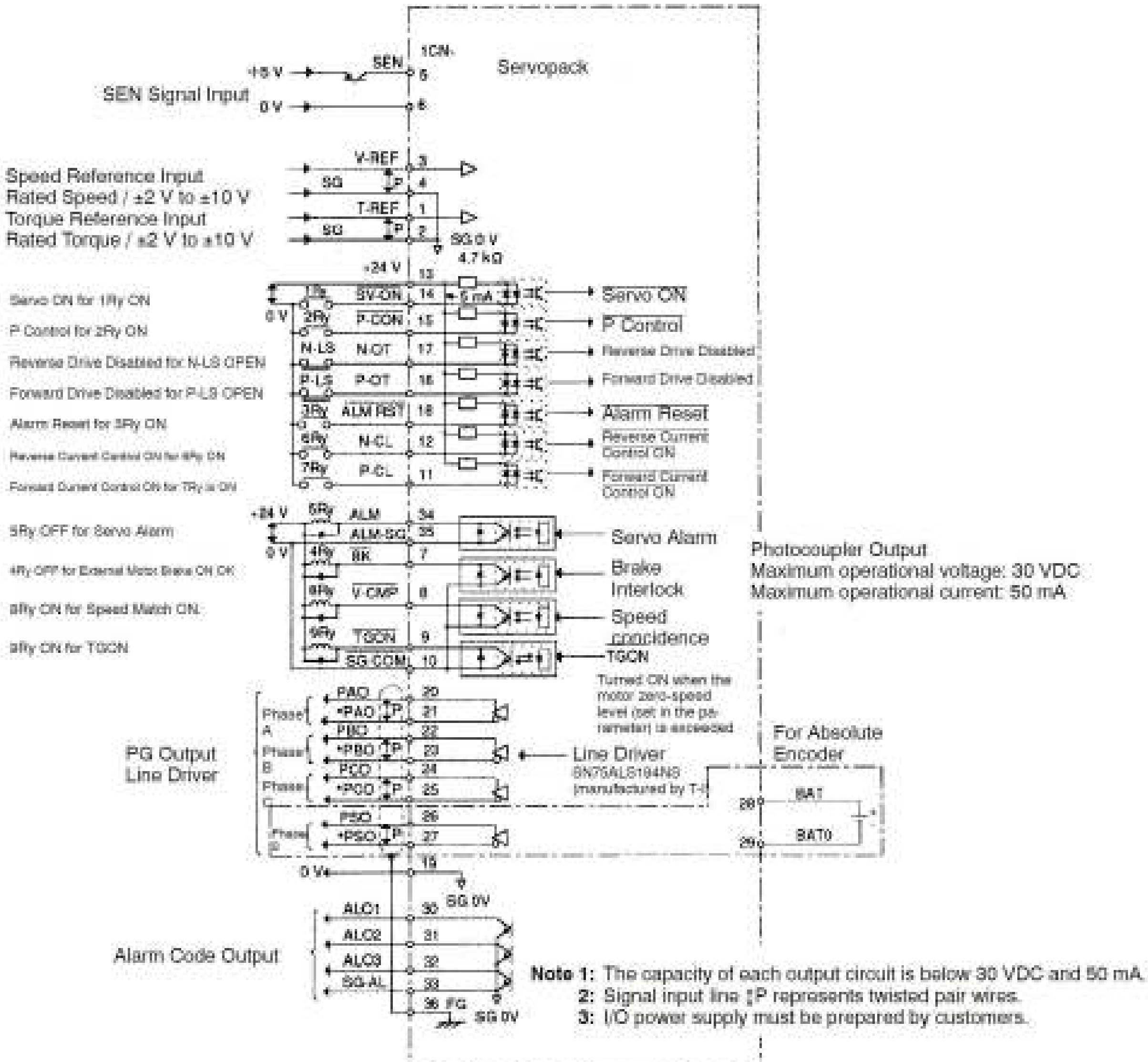
*1. (twisted-pair symbol) represents twisted-pair wires.

*2. Connect when using an absolute encoder. When the encoder cable with the battery case is connected, do not connect a backup battery.

*3. Enabled by the parameter setting.

*4. The 24-VDC power supply is not included. Use a 24-VDC power supply with double insulation or reinforced insulation.

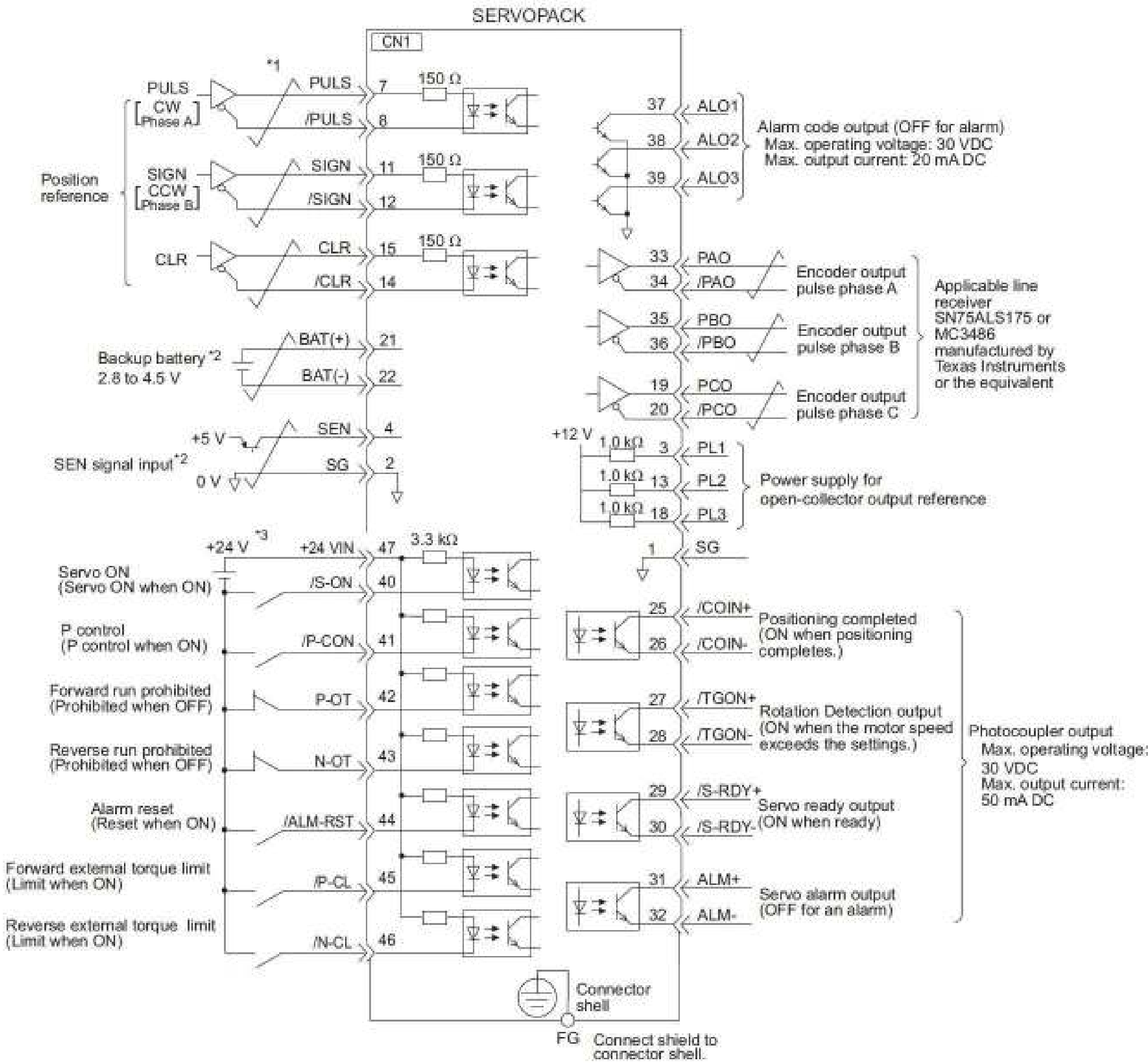
CACR-***-EE*VAS-00 : 36PIN analog reference
Connection example in speed control is as shown below.



4.3.2. Position control Example

CACR-***-EE*VBD-00 (50PIN analog/pulse reference)

Connection example in position control is as shown below.

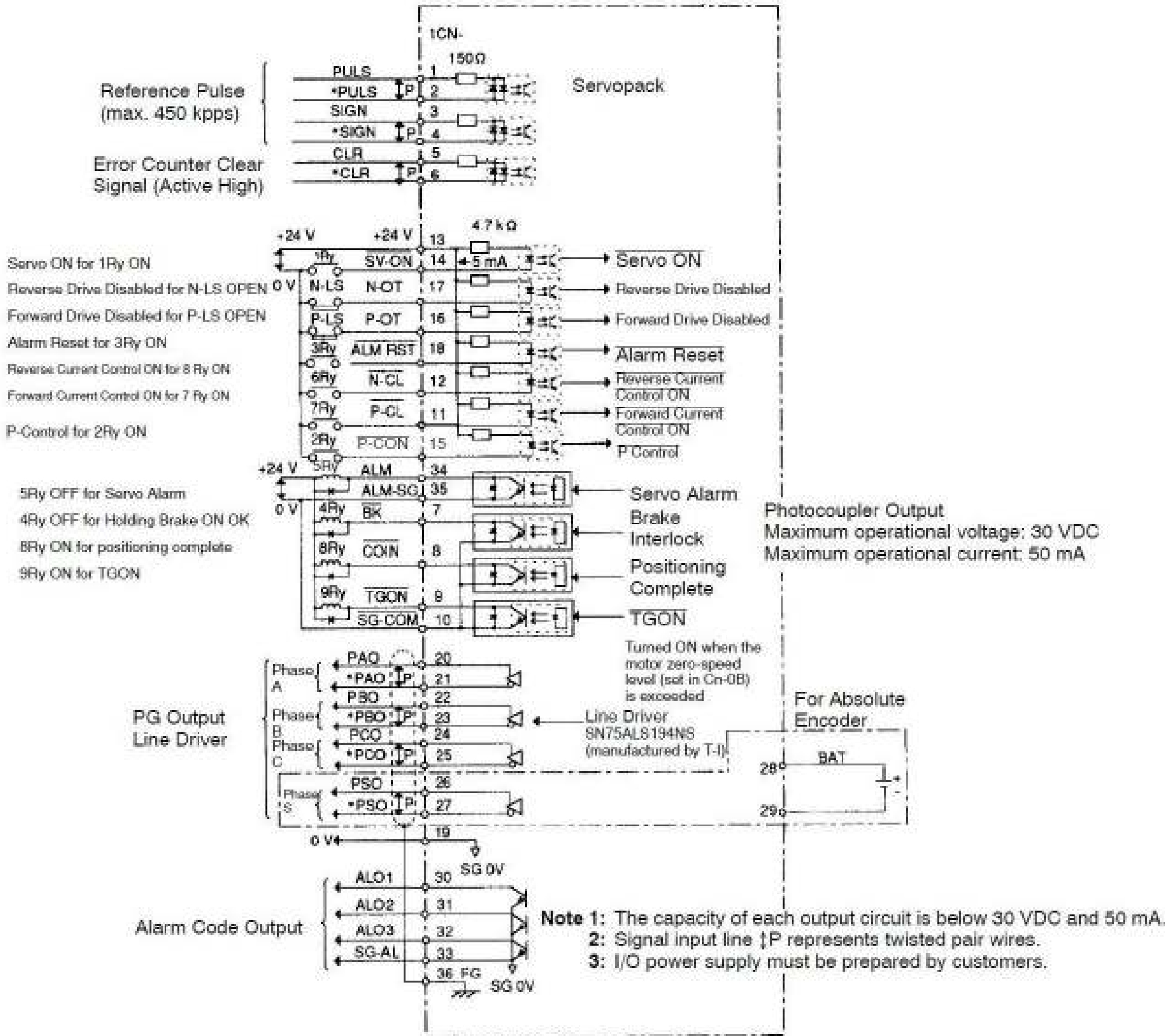


*1. (twisted-pair symbol) represents twisted-pair wires.

*2. Connect when using an absolute encoder. When the encoder cable with the battery case is connected, do not connect a backup battery.

*3. The 24-VDC power supply is not included. Use a 24-VDC power supply with double insulation or reinforced insulation.

CACR-***-EE*VAP-00 : 36PIN position reference
Connection example in speed control is as shown below.

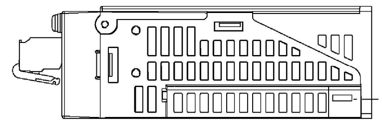


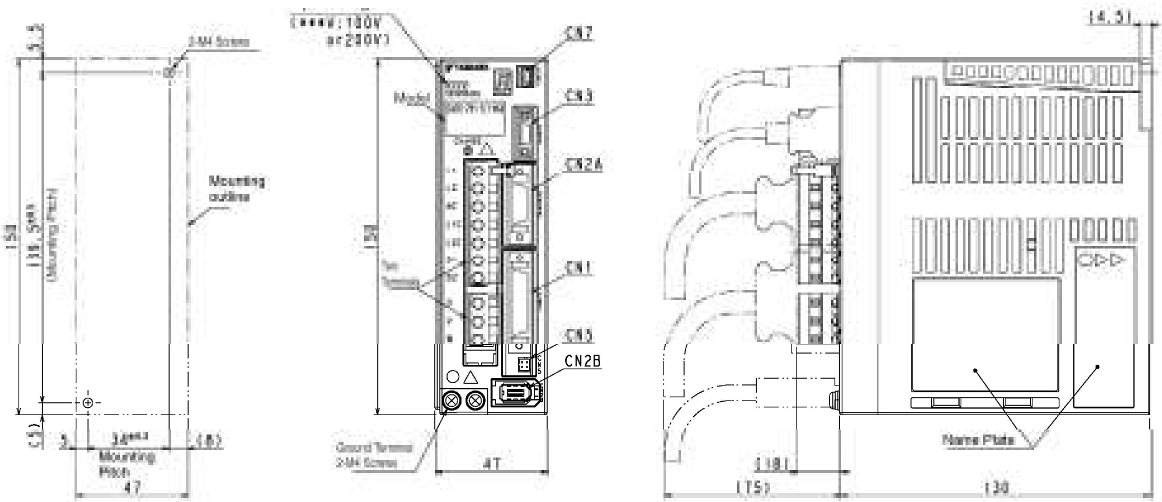
5. External Dimensions

5.1. A

5.1.1. A (36) [W47 H150 D130]

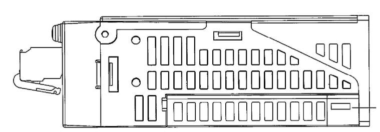
CACR-R70-EE2VAS-00 CACR-R70-EE2VAP-00
CACR-R90-EE2VAS-00 CACR-R90-EE2VAP-00
CACR-2R1-EE2VAS-00 CACR-2R1-EE2VAP-00
CACR-R44-EE1VAS-00 CACR-R44-EE1VAP-00
CACR-R70-EE1VAS-00 CACR-R70-EE1VAP-00
CACR-R90-EE1VAS-00 CACR-R90-EE1VAP-00
CACR-2R1-EE1VAS-00 CACR-2R1-EE1VAP-00

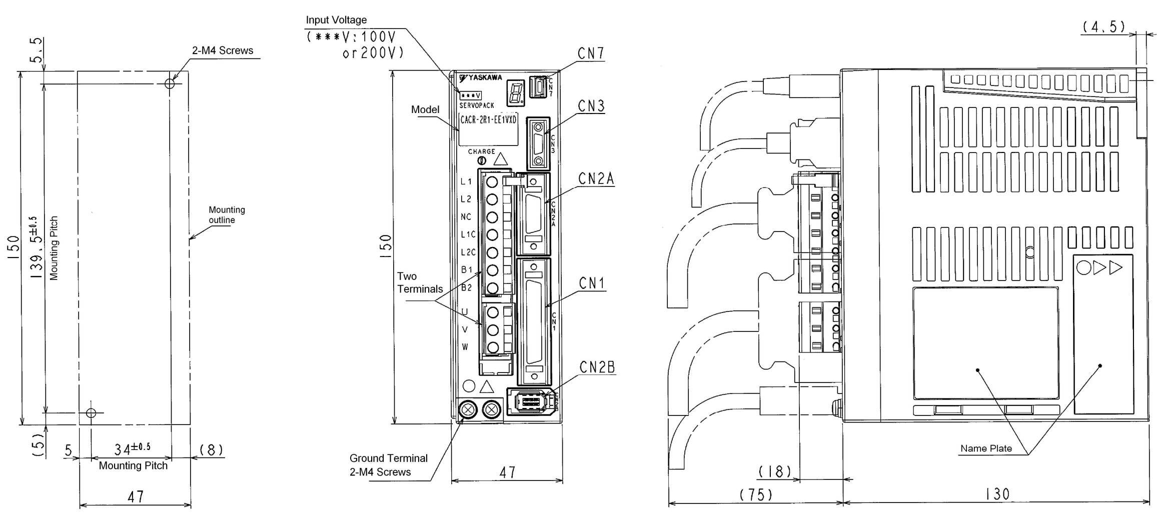




5.1.2. A (50) [W47 H150 D130]

CACR-R70-EE2VBD-00
CACR-R90-EE2VBD-00
CACR-2R1-EE2VBD-00
CACR-R44-EE1VBD-00
CACR-R70-EE1VBD-00
CACR-R90-EE1VBD-00
CACR-2R1-EE1VBD-00

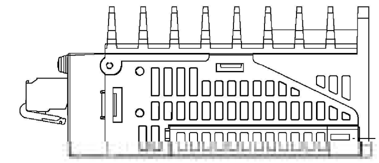


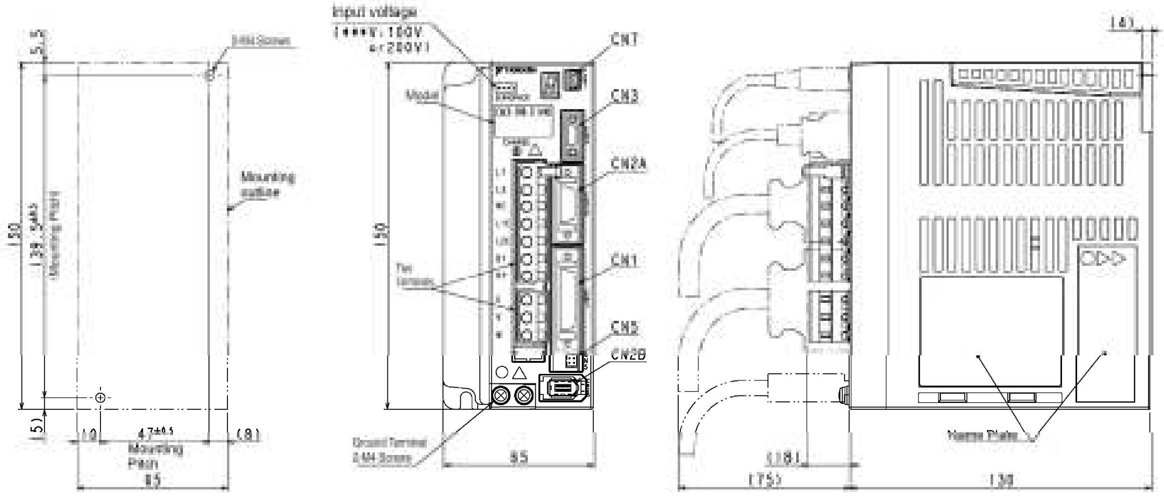


5.2. B

5.2.1. B (36) [W65 H150 D130]

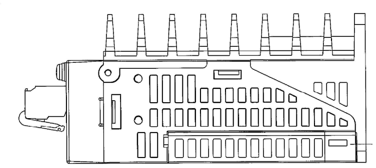
CACR-2R8-EE2VAS-00
CACR-2R8-EE1VAS-00
CACR-2R8-EE2VAP-00
CACR-2R8-EE1VAP-00

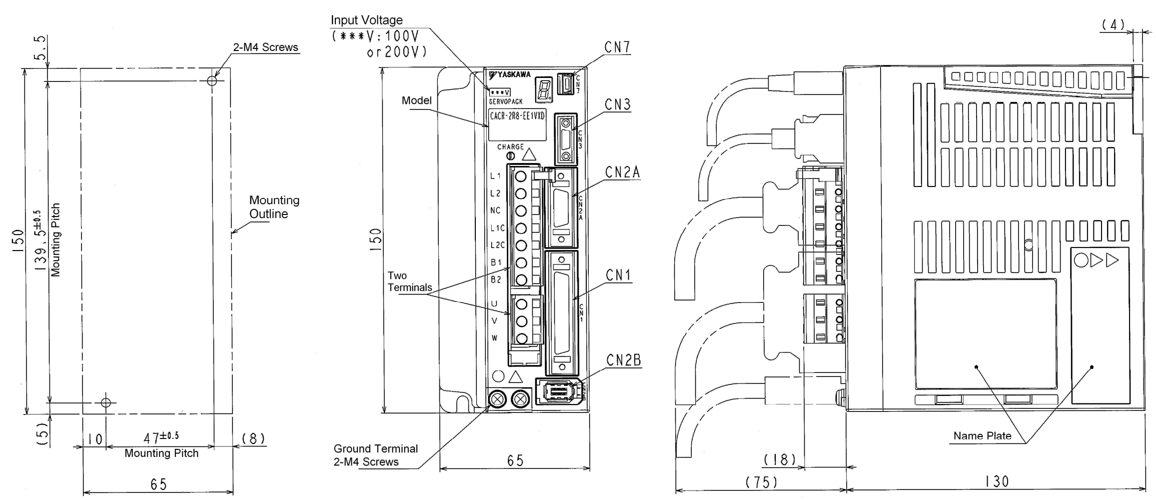




5.2.2. B (50) [W65 H150 D130]

CACR-2R8-EE2VBD-00
CACR-2R8-EE1VBD-00

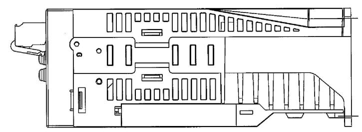


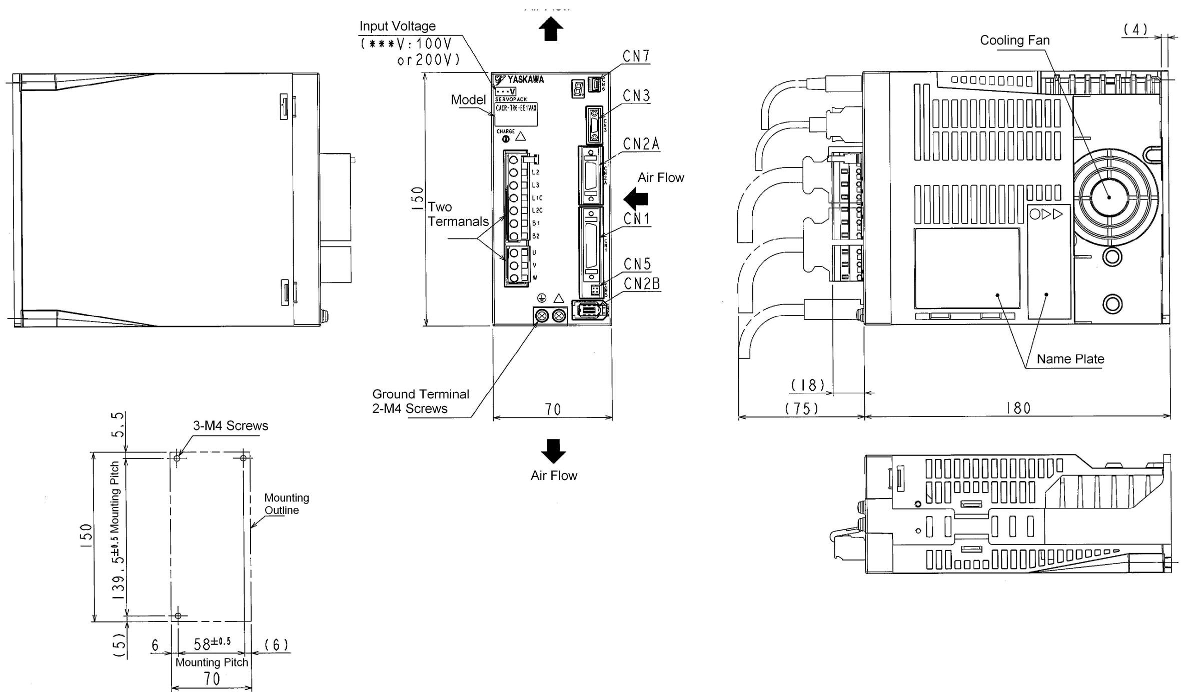


5.3. C

5.3.1. C (36) [70 H150 D180]

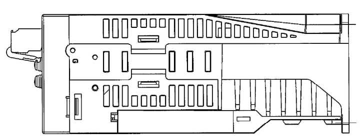
CACR-5R5-EE2VAS-00
CACR-5R5-EE1VAS-00
CACR-5R5-EE2VAP-00
CACR-5R5-EE1VAP-00

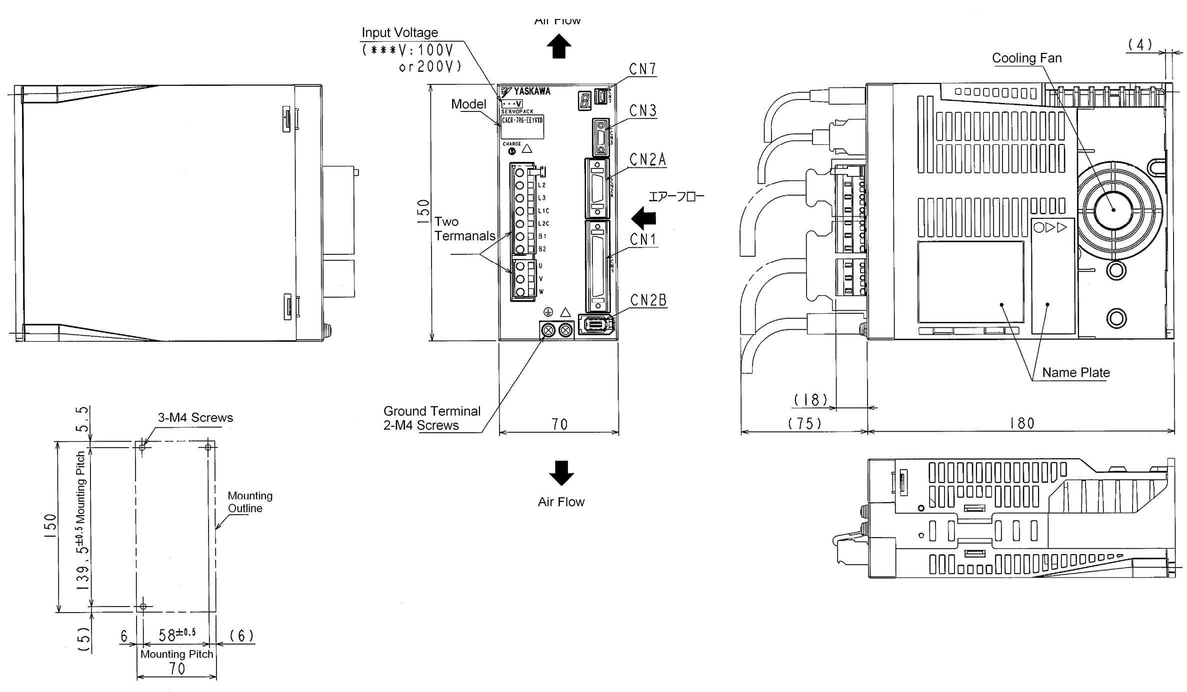




5.3.2. C (50) [W70 H150 D180]

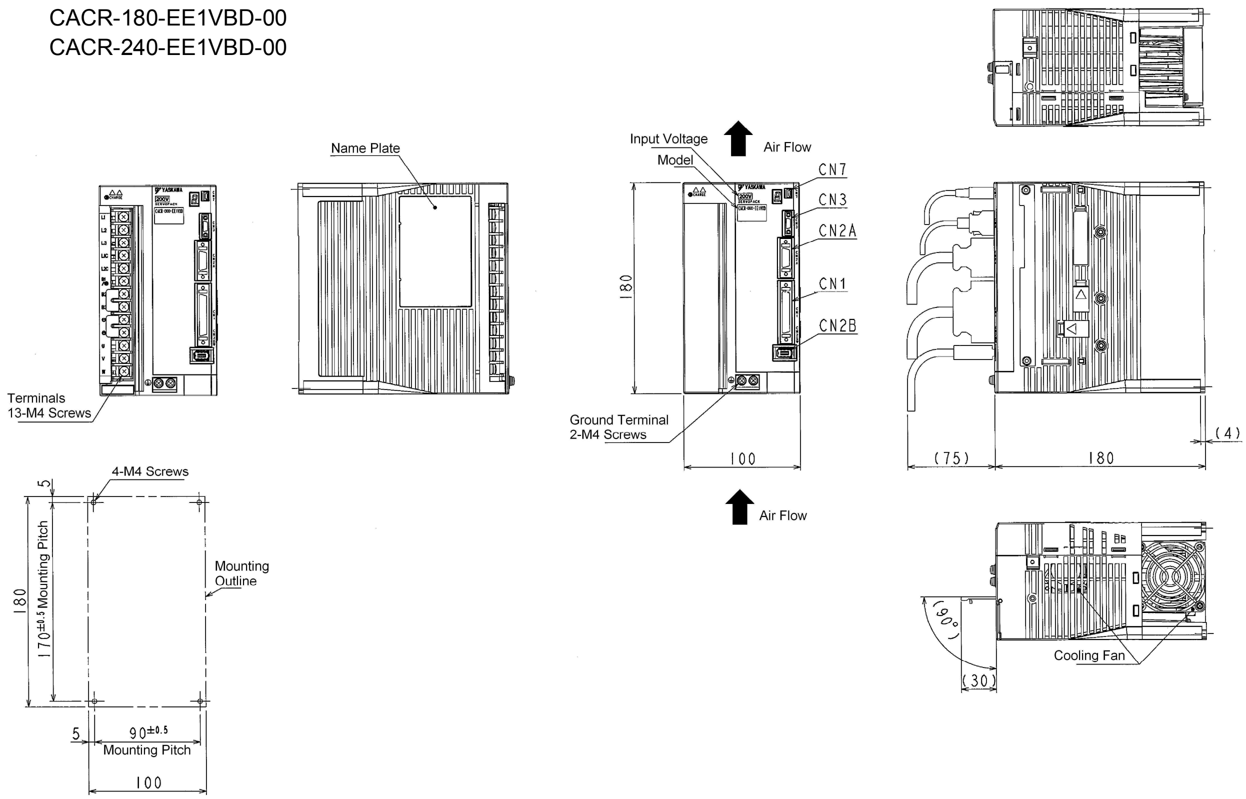
CACR-5R5-EE2VBD-00
CACR-5R5-EE1VBD-00
CACR-3R8-EE1VBD-00
CACR-7R6-EE1VBD-00





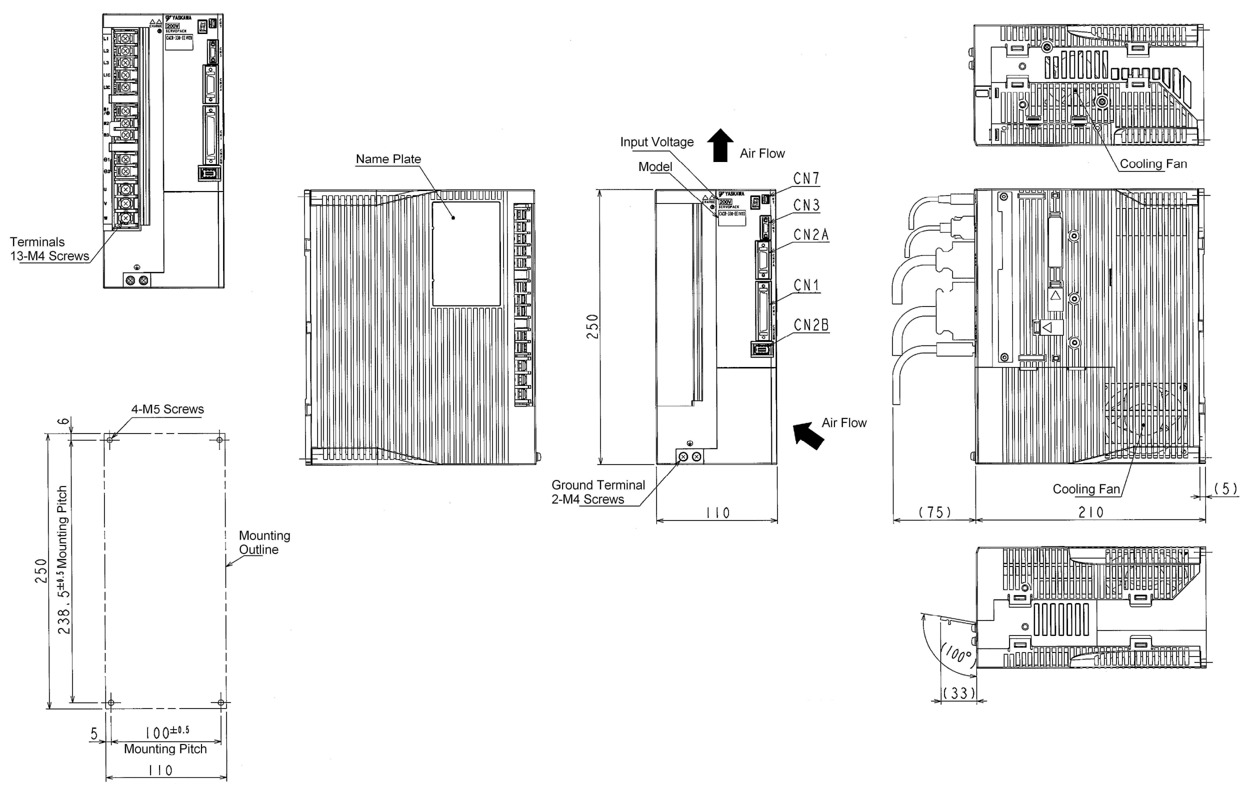
5.4. D [W100 H180 D180]

CACR-120-EE1VBD-00
CACR-180-EE1VBD-00
CACR-240-EE1VBD-00



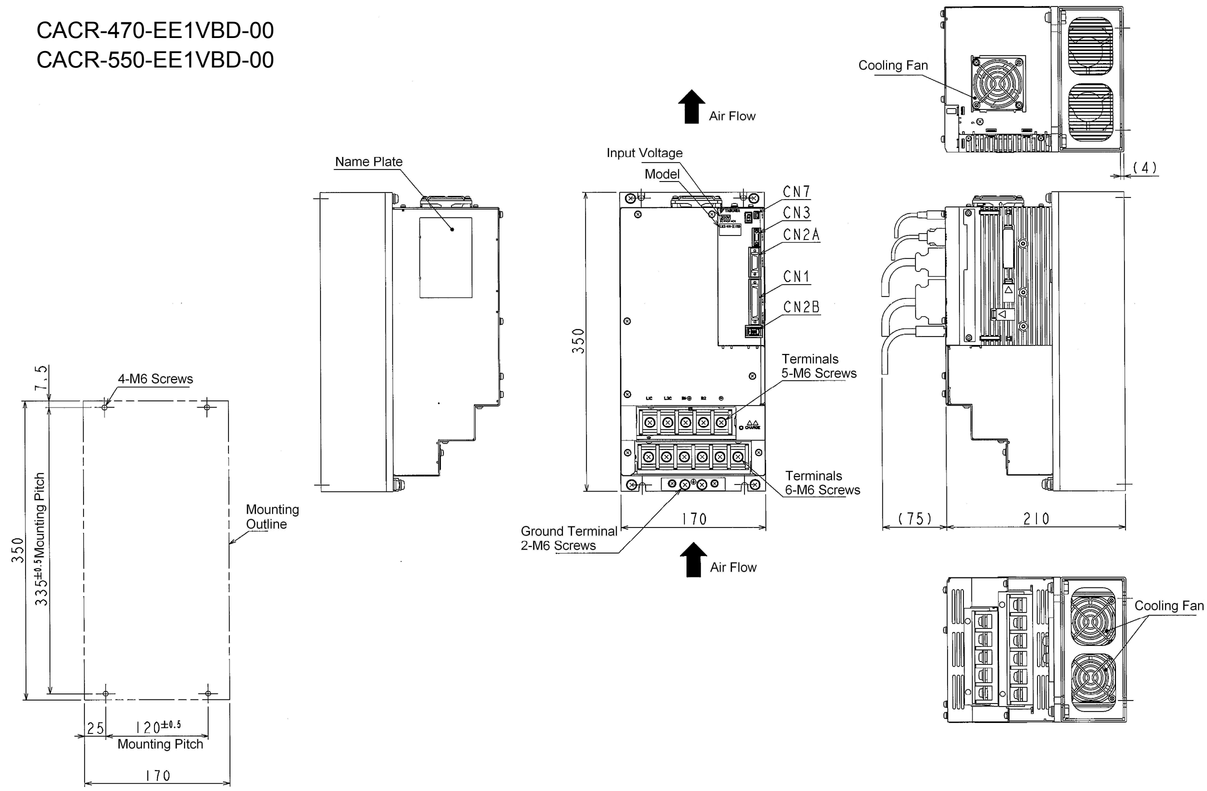
5.5. E [W110 H250 D210]

CACR-330-EE1VBD-00



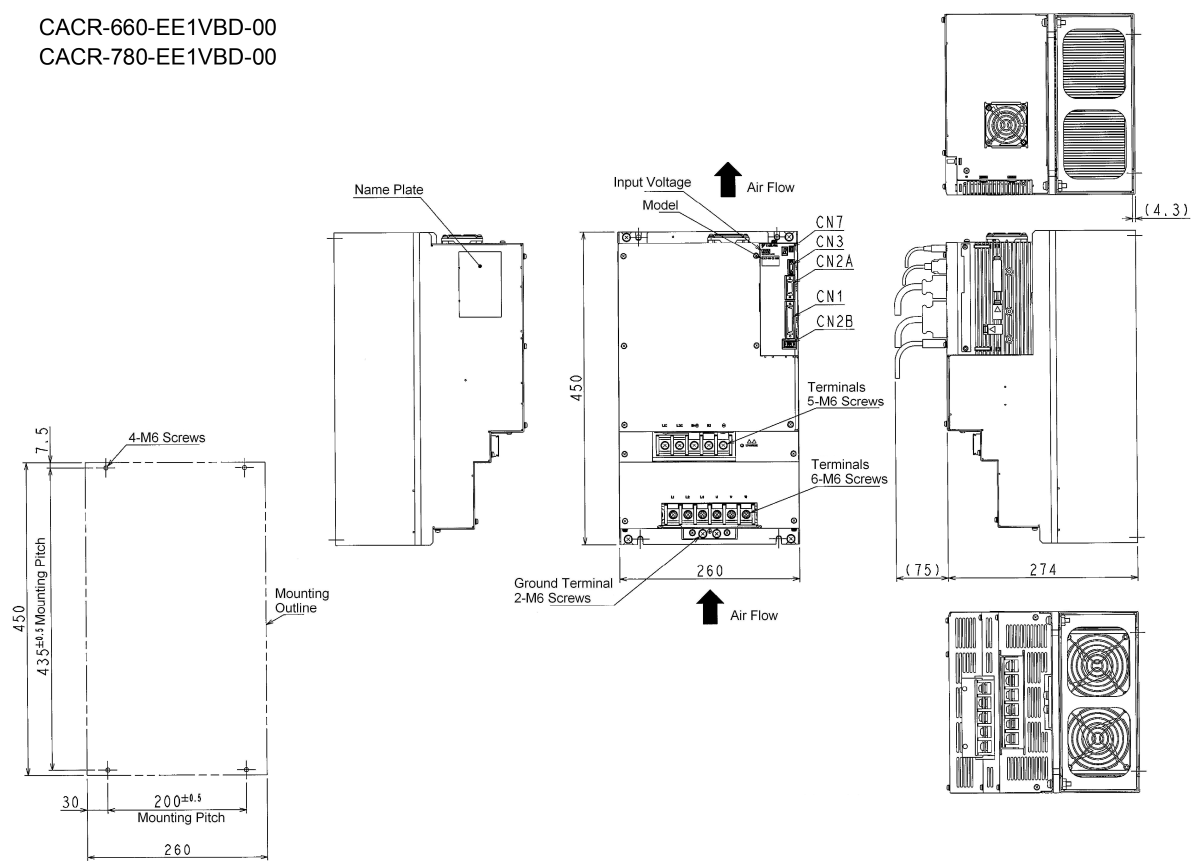
5.6. F [W170 H350 D210]

CACR-470-EE1VBD-00
CACR-550-EE1VBD-00



5.7. G [W260 H450 D274]

CACR-660-EE1VBD-00
CACR-780-EE1VBD-00



6. Parameters

In EGSV3 SERVOPACKs, following parameters is added to standard Σ-V.

⚠ caution	The parameters without explanations in this manual and Σ-V manual are set at factory. If you change it carelessly, machine move unexpected way. Failure to observe this caution may result in injury or malfunction.

6.1. Additional User's Parameters to Standard Σ-V

Parameter No.	Name	Setting Range	Units	Factory Setting	When Enabled	Classification
Pn000	Function Select Switch 0	0000 - 03B3	--	0300 0310	After restart	Setup

4th digit 3rd digit 2nd digit 1st digit
n.□□□□

1st digit: **Direction Selection**
* Parameter is same as standard Σ-V.

2nd digit: **Control Method Selection**
* Parameter is same as standard Σ-V.

Reference Method	Factory Setting
D : Analog and Pulse reference S : Analog reference	0
P : Pulse reference	1

3rd digit: **Encoder Output Pulses Function Selection**

0～2	Reserved (Do not change.)
3	Output Pulses Function Automatically Select

4th digit: **Reserved (Do not change.)**

Parameter No.	Name	Setting Range	Units	Factory Setting	When Enabled	Classification
Pn002	Function Select Switch 2	0000 - 4313	--	0000	After restart	Setup

4th digit 3rd digit 2nd digit 1st digit
n.□□□□

1st digit: **Speed and/or Position Control Option (T-REF Terminal Allocation)**
* Parameter is same as standard Σ-V.

2nd digit: **Torque Control Option (V-REF Terminal Allocation)**
* Parameter is same as standard Σ-V.

3rd digit: **Absolute Encoder Usage**

0	Uses absolute encoder as an absolute encoder.
1	Reserved (Do not change.)
2	Reserved (Do not change.)
3	Reserved (Do not change.)

4th digit: **External Encoder Usage**
*EGSV3 does not have this function

Parameter No.	Name	Range	Units	Factory Setting	When Enabled	Classification
Pn009	Function Select Switch 9	0000 - 7111	--	0010	After restart	Tuning

n.□□□□ (4th digit, 3rd digit, 2nd digit, 1st digit)

1st digit: Reserved (Do not change.)

2nd digit: Current Control Method Selection

* Parameter is same as standard Σ-V.

3rd digit: Speed Detection Method Selection

* Parameter is same as standard Σ-V.

4th digit: Select Power supply voltage for Encoder

0	5.2V
1	5.3V
2	5.4V
3	5.5V
4	5.6V
5	5.8V
6	5.9V
7	6.0V

Parameter No.	Name	Range	Units	Factory Setting	When Enabled	Classification
Pn00B	Function Select Switch B	0000 - 1111	--	0000 0100	After restart	Setup

n.□□□□ (4th digit, 3rd digit, 2nd digit, 1st digit)

1st digit: Parameter Display Selection

* Parameter is same as standard Σ-V.

2nd digit: Alarm Gr.2 Stop Method Selection

* Parameter is same as standard Σ-V.

3rd digit: Power Supply Method for Three-phase SERVOPACK

0	Three-phase power supply
1	Single-phase power supply

*Parameter is same as standard Σ-V.
But factory setting is depending on Model.

Power range	Factory setting
3R8、7R6、120、180、240、330、470、550、660、780	0
R44、R70、R90、2R1、2R8、5R5	1

4th digit: Reserved (Do not change.)

Parameter No.	Name	Range	Units	Factory Setting	When Enabled	Classification
Pn170	Reserved (Do not change.)	--	--	0000	--	--

Parameter No.	Name	Setting Range	Units	Factory Setting	When Enabled	Classification
Pn212	Encoder Output Pulses	16 - 1073741824	1 P/ Rev	Depend on Model	After restart	Setup
	Power range / Factory setting: R44、R70、R90、2R1、2R8、5R5: 2048 3R8、7R6、120、180、240、330、470、550、660、780: 8192					
Pn230	Reserved (Do not change.)	—	—	0000	—	—
Pn232	Motor select	0100 - 0102	--	0100	After restart	Setup
	n.□□□□ (4th digit, 3rd digit, 2nd digit, 1st digit) 1st digit: Select Motor parameter 0: Motor Parameter 1 1: Motor Parameter 2 2: Reserved (Do not change.) Note. Refer the selection table on chapter 6.3 2nd digit: Reserved (Do not change.) 3rd digit: Reserved (Do not change.) 4th digit: Reserved (Do not change.)					

Power range	Factory setting
R44、R70、R90、2R1、2R8、5R5	2048
3R8、7R6、120、180、240、330、470、550、660、780	8192

Select Motor parameter	
0	Motor Parameter 1
1	Motor Parameter 2
2	Reserved (Do not change.)

Parameter No.	Name	Setting Range	Units	Factory Setting	When Enabled	Classification
Pn50E	Output Signal Selection 1	0000 - 3333	—	0211 or 3211 (Note1)	After restart	Setup

n.□□□□ (4th digit, 3rd digit, 2nd digit, 1st digit)

1st digit: Positioning Completion Signal Mapping (/COIN)

0-3	(Note2)

2nd digit: Speed Coincidence Detection Signal Mapping (/V-CMP)

0-3	(Note2)

3rd digit: Servomotor Rotation Detection Signal Mapping (/TGON)

0-3	(Note2)

4th digit: Servo Ready Signal Mapping (/S-RDY)

0-3	(Note2)

Parameter No.	Name	Setting Range	Units	Factory Setting	When Enabled	Classification
Pn50F	Output Signal Selection 2	0000 - 3333	--	0300 or 0000 (Note1)	After restart	Setup

n.□□□□ (4th digit, 3rd digit, 2nd digit, 1st digit)

1st digit: Torque Limit Detection Signal Mapping (/CLT)

0-3	(Note2)

2nd digit: Speed Limit Detection Signal Mapping (/VLT)

0-3	(Note2)

3rd digit: Brake Signal Mapping (/BK)

0-3	(Note2)

4th digit: Warning Signal Mapping (/WARN)

0-3	(Note2)

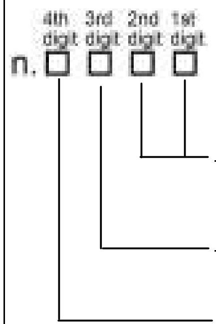
(Note1) Factory setting

SERVOPACK model	Factory setting	
	Pn50E	Pn50F
CACR-□□□-EE□VA□-00	0211	0300
CACR-□□□-EE□VBD-00	3211	0000

(Note2) The relation between parameter setting and external terminal is as follows.

Set value	Output terminal	
	CACR-□□□-EE□VA□-00	CACR-□□□-EE□VBD-00
0	Disabled (Applicable signal is not used.)	Disabled (Applicable signal is not used.)
1	Outputs the signal from CN1-8, -10.	Outputs the signal from CN1-25, -26
2	Outputs the signal from CN1-9, -10	Outputs the signal from CN1-27, -28
3	Outputs the signal from CN1-7, -10	Outputs the signal from CN1-29, -30

Parameter No.	Name	Setting Range	Units	Factory Setting	When Enabled	Classification
PnF20 (Note1)	Motor 1 Encoder selection	0000 - FFFF	--	Depend on model (Note2)	After restart	Setup

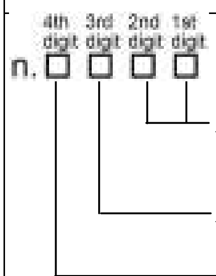


Encoder pulse selection
Refer to chapter 6.2 [encoder pulse selection table]

Reserved (Do not change.)

Encoder Type selection	
1	Absolute encoder
3	Incremental encoder

Parameter No.	Name	Setting Range	Units	Factory Setting	When Enabled	Classification
PnF40 (Note1)	Motor 2 Encoder selection	0000 - FFFF	--	Depend on model (Note2)	After restart	Setup



Encoder pulse selection
Refer to chapter 6.2 [encoder pulse selection table]

Reserved (Do not change.)

Encoder Type selection	
1	Absolute encoder
3	Incremental encoder

(Note1) PnF20 and PnF40 are not supported by parameter initialized function (Fn005)
(Note2) Factory setting of PnF20 and PnF40 are as shown below.

SERVOPACK model	Factory setting
CACR-R70-EE2V□□-00 CACR-R90-EE2V□□-00 CACR-2R1-EE2V□□-00 CACR-2R8-EE2V□□-00 CACR-5R5-EE2V□□-00	300B
CACR-R44-EE1V□□-00 CACR-R70-EE1V□□-00 CACR-R90-EE1V□□-00 CACR-2R1-EE1V□□-00 CACR-2R8-EE1V□□-00 CACR-5R5-EE1V□□-00	310B
CACR-3R8-EE1VBD-00 CACR-7R6-EE1VBD-00 CACR-120-EE1VBD-00 CACR-180-EE1VBD-00 CACR-240-EE1VBD-00 CACR-330-EE1VBD-00 CACR-470-EE1VBD-00 CACR-550-EE1VBD-00 CACR-660-EE1VBD-00 CACR-780-EE1VBD-00	310C

6.2. Encoder Pulse Parameter

Encoder pulse is selected as following table in parameter PnF20.1.0 and PnF40.1.0.

PnF20.1,0 or PnF40.1,0	Encoder pulse
00	Prohibited
01	1000
02	1440
03	1500
04	2000
05	2500
06	4000
07	5000
08	6000
09	20000
0A	30000
0B	2048
0C	8192
0D	16384
0E	32768
0F	1024
10	8192
11	32768
12	4096

6.3. Motor Parameter

Motor parameter is selected as following table in Pn232.0
Refer the chapter 11.5 if model of motor is not listed in this table.

SERVOPACK	Motor parameter 1	Motor parameter 2
CACR-R70-EE2VAS-00	SGM-A3B	Same as in the left
CACR-R70-EE2VAP-00	SGM-A3B	Same as in the left
CACR-R70-EE2VBD-00	SGM-A3B	Same as in the left
CACR-R90-EE2VAS-00	SGM-A5B	Same as in the left
CACR-R90-EE2VAP-00	SGM-A5B	Same as in the left
CACR-R90-EE2VBD-00	SGM-A5B	Same as in the left
CACR-2R1-EE2VAS-00	SGM-01B	SGMP-01B
CACR-2R1-EE2VAP-00	SGM-01B	SGMP-01B
CACR-2R1-EE2VBD-00	SGM-01B	SGMP-01B
CACR-2R8-EE2VAS-00	SGM-02B	SGMP-02B
CACR-2R8-EE2VAP-00	SGM-02B	SGMP-02B
CACR-2R8-EE2VBD-00	SGM-02B	SGMP-02B
CACR-5R5-EE2VAS-00	SGM-03B	SGMP-03B
CACR-5R5-EE2VAP-00	SGM-03B	SGMP-03B
CACR-5R5-EE2VBD-00	SGM-03B	SGMP-03B
CACR-R44-EE1VAS-00	SGM-A3A	Same as in the left
CACR-R44-EE1VAP-00	SGM-A3A	Same as in the left
CACR-R44-EE1VBD-00	SGM-A3A	Same as in the left
CACR-R70-EE1VAS-00	SGM-A5A	Same as in the left
CACR-R70-EE1VAP-00	SGM-A5A	Same as in the left
CACR-R70-EE1VBD-00	SGM-A5A	Same as in the left
CACR-R90-EE1VAS-00	SGM-01A	SGMP-01A
CACR-R90-EE1VAP-00	SGM-01A	SGMP-01A
CACR-R90-EE1VBD-00	SGM-01A	SGMP-01A
CACR-2R1-EE1VAS-00	SGM-02A	SGMP-02A
CACR-2R1-EE1VAP-00	SGM-02A	SGMP-02A
CACR-2R1-EE1VBD-00	SGM-02A	SGMP-02A
CACR-2R8-EE1VAS-00	SGM-04A	SGMP-04A
CACR-2R8-EE1VAP-00	SGM-04A	SGMP-04A
CACR-2R8-EE1VBD-00	SGM-04A	SGMP-04A
CACR-3R8-EE1VBD-00	SGMG-05A*A	SGM-A5A
CACR-5R5-EE1VAS-00	SGM-08A	SGMP-08A
CACR-5R5-EE1VAP-00	SGM-08A	SGMP-08A
CACR-5R5-EE1VBD-00	SGM-08A	SGMP-08A
CACR-7R6-EE1VBD-00	SGMG-09A*A	SGMS-10A*A
CACR-120-EE1VBD-00	SGMG-13A*A	SGMS-15A*A
CACR-180-EE1VBD-00	SGMG-20A*A	SGMS-20A*A
CACR-240-EE1VBD-00	SGMG-30A*A	SGMS-30A*A
CACR-330-EE1VBD-00	SGMG-44A*A	SGMS-40A*A
CACR-470-EE1VBD-00	SGMG-55A*A	SGMG-60A*B
CACR-550-EE1VBD-00	SGMG-75A*A	Same as in the left
CACR-660-EE1VBD-00	SGMG-1AA*A	Same as in the left
CACR-780-EE1VBD-00	SGMG-1EA*A	Same as in the left

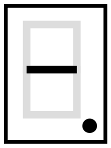
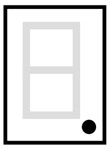
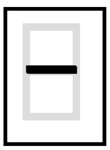
7. 7-Segment LED Display

One figure of 7-Segment LED is mounted in front of SERVOPACKs and it indicates the operating conditions and alarm status of SERVOPACKs.

7.1. Status Display Mode

7.1.1. Operating conditions

The operating conditions are displayed in one figure.

indication	Specification	Indication on digital operator
	Base Block (BB) (Power supply to motor is turned OFF)	BB
	Run (Power supply to motor is turned ON)	RUN
	Initialize or Downloading	CPF00 or CPF01

7.1.2. Status during Over Travel

[POT] and [NOT] is displayed each character by turns. And if [POT] and [NOT] happens at same time, it is displayed alternately.

Example [POT]

[**P**] → fade out → [**o**] → fade out → [**t**] → fade out

7.1.3. Status during Alarm or Warning

Number of alarm or warning is displayed each character by turns.

Example [A.C20]

[**A**] → fade out → [**C**] → fade out → [**2**] → fade out → [**0**] → fade out

7.2. Additional Alarm and Warning

EGSV3 adds the alarm and warning function to Σ-V SERVOPACKs as shown below.
Refer to a SIJP S80000045 "AC Servo Drives Σ-V Series USER'S MANUAL Design and Maintenance Rotational Motor Analog Voltage and Pulse Train Reference" for the overlapping part with Σ-V standard product.

7.2.1. Additional Alarm

Alarm Number	Alarm name	Meaning	Servomotor Stopping Method	Alarm Reset	Alarm Code Output		
					ALO1	ALO2	ALO3
A.800	C-phase error or Pulse error	Detecting C-phase is not correct 1 rotate.	Gr1	N/A	H	H	H
A.C20	Phase error at the power turned on	Detection of UVW phase is not correct at the power turned on.	Gr1	N/A	L	H	L
A.C21	Phase error at the operating	Detection of UVW phase is not correct at the operating.	Gr1	N/A	L	H	L
A.C22	Initial rotation data error	Receiving time of initial data is over.	Gr1	N/A	L	H	L
A.C30	PG disconnection 1 (A)	Encoder A-phase is disconnected.	Gr1	N/A	L	H	L
A.C31	PG disconnection 1 (B)	Encoder B-phase is disconnected.	Gr1	N/A	L	H	L
A.C40	PG disconnection 1 (C)	Encoder C-phase is disconnected.	Gr1	N/A	L	H	L

Gr1 : The servomotor is stopped according to the setting in Pn001.0 if an alarm occurs. Pn001.0 is factory-set to stop the servomotor by applying the DB.

7.2.2. Additional Warning

Alarm Number	Warning name	Meaning
A.912	Heat sink temperature warning	Heat sink temperature is over setting temperature

8. Utility Functions (Fn□□□)

Utility functions are used to execute the functions related to servomotor operation and adjustment.
Each utility function has a number starting with Fn.
The following table lists the utility functions and reference section.
And refer to the next document about operation method and meaning of function.

*Document

(1) SIEP S800000 45□
AC Servo Drives
Σ-V Series USER'S MANUAL
Design and Maintenance
Rotational Motor
Analog Voltage and Pulse Train Reference

(2) SIEP S800000 55□
AC Servo Drives
Σ-V Series USER'S MANUAL
Digital operator

Function No.	Function
Fn000	Alarm history display
Fn002	JOG operation
Fn005	Initializing parameter settings
Fn006	Clearing alarm history
Fn009	Automatic tuning of analog (speed, torque) reference offset
Fn00A	Manual servo tuning of speed reference offset
Fn00B	Manual servo tuning of torque reference offset
Fn00C	Offset adjustment of analog monitor output
Fn00D	Gain adjustment of analog monitor output
Fn00E	Automatic offset-signal adjustment of the motor current detection signal
Fn00F	Manual offset-signal adjustment of the motor current detection signal
Fn010	Write prohibited setting
Fn030	Software reset

(Note) Do not use the function that is not listed in this table.

9. Monitor Modes (Un□□□)

The monitor mode can be used for monitoring the I/O signal status, and SERVOPACK internal status. Refer to the following table.
And refer to the next document about operation method and meaning of function.

*Document

(1) SIEP S800000 45□
AC Servo Drives
Σ-V Series USER'S MANUAL
Design and Maintenance
Rotational Motor
Analog Voltage and Pulse Train Reference

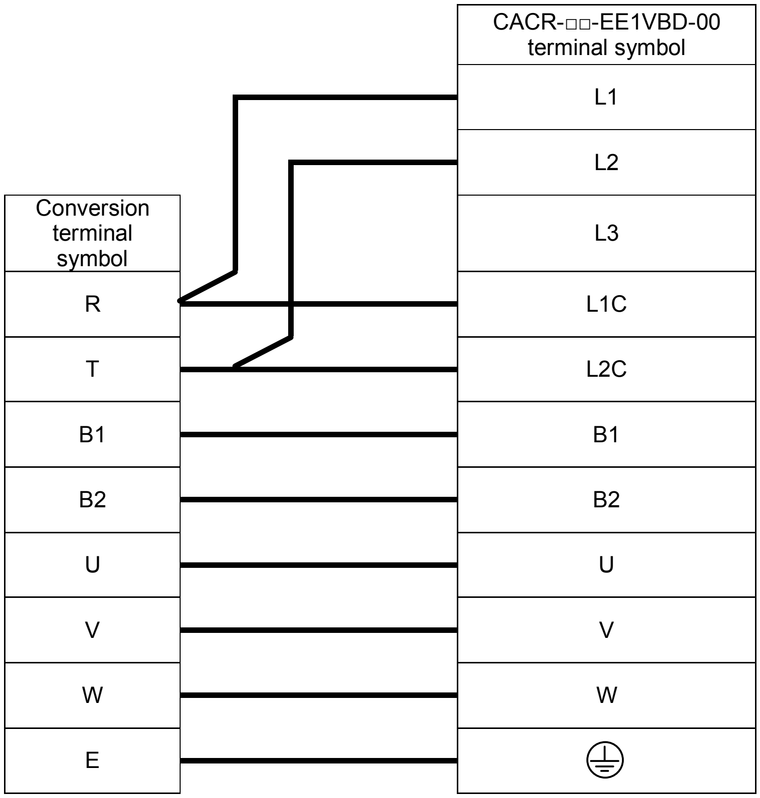
(2) SIEP S800000 55□
AC Servo Drives
Σ-V Series USER'S MANUAL
Digital operator

Un Number	Content of Display	Unit
Un000	Motor rotating speed	min-1
Un001	Speed reference	min-1
Un002	Internal torque reference (in percentage to the rated torque)	%
Un003	Electric angle 1 (The number of encoder pulse from C-phase: decimal display)	Encoder resolution
Un004	Electric angle 2 (electric angle from polarity origin)	Deg
Un005	Input signal monitor	–
Un006	Output signal monitor	–
Un007	Input reference pulse speed (valid only in position control)	min-1
Un008	Position error amount (valid only in position control)	reference unit
Un00C	Input reference pulse counter	reference unit
Un00D	Feedback pulse counter	Encoder resolution・
Un012	Total operation time	100 ms
Un013	Feedback pulse counter	reference unit

10. Peripherals

10.1. Connection Diagram of Attachment

10.1.1. Attachment for CACR-□□□-EE□VA□-00



(Note) JUSP-RG08, conventional Regenerative unit, can not be connected to B1-B2 terminal.
When processing the regenerated energy is needed, use the EGDR-R01 that is Regenerative resistor for CACR-□□□-EE□VA□-00.

If JUSP-RG08C and external regenerative resistor is used on existing system, this regenerative resistor can be connected to CACR-□□□-EE□VA□-00 directly.
In this case, the value of resistance capacity must be set on Parameter Pn600.

10.1.2. Attachment for CACR-□□□-EE1VBD-00
(Except CACR-120-EE1VBD-00, CACR-180-EE1VBD-00, CACR-240-EE1VBD-00, CACR-330-EE1VBD-00)

Conversion terminal symbol	CACR-□□-EE1VBD-00 terminal symbol
R	L1
S	L2
T	L3
R	L1C
T	L2C
P	B1
B	B2
U	U
V	V
W	W
E	⏚

10.1.3. Attachment for CACR-□□□-EE1VBD-00 (□:120, 180, 240, 330)

Conversion terminal symbol		CACR-□□-EE1VBD-00 terminal symbol
R		L1
S		L2
T		L3
R		L1C
T		L2C
P		B1
B		B2
	Short bar→ (note)	B3
U		U
V		V
W		W
E		⏚

(Note): If external regenerative resistor is connected to EGSV3, change short bar connection form B2-B3 to B1-B2
And the value of resistance capacity must be set on Parameter Pn600.

10.2. Attachment Dimensions

10.2.1. Replacement for SGDA 100V 30W - 100W and 200V 30W - 200W

■Applied EGSV3

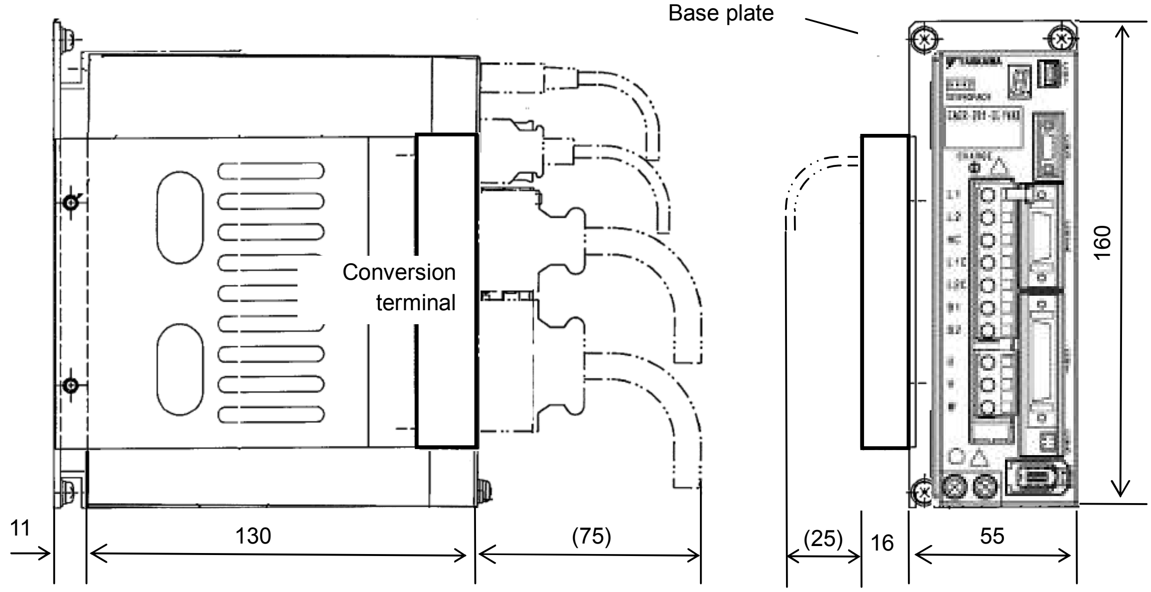
CACR-R70-EE2VAS-00	CACR-R70-EE2VAP-00
CACR-R90-EE2VAS-00	CACR-R90-EE2VAP-00
CACR-2R1-EE2VAS-00	CACR-2R1-EE2VAP-00
CACR-R44-EE1VAS-00	CACR-R44-EE1VAP-00
CACR-R70-EE1VAS-00	CACR-R70-EE1VAP-00
CACR-R90-EE1VAS-00	CACR-R90-EE1VAP-00
CACR-2R1-EE1VAS-00	CACR-2R1-EE1VAP-00

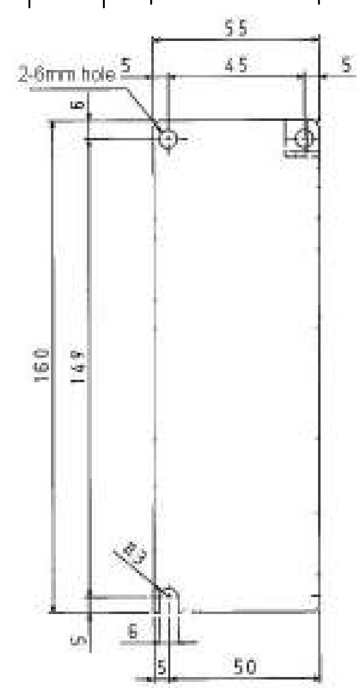
■Dimensions

Σ-I: [W55 H160 D130] → EGSV3 with attachment: [W71 H160 D141]

*Dimensions of Width (W) and depth (D) is not included Connector and cable assembling

Additional dimensions for connector and cable assembling is 25mm as width and 75mm as depth.





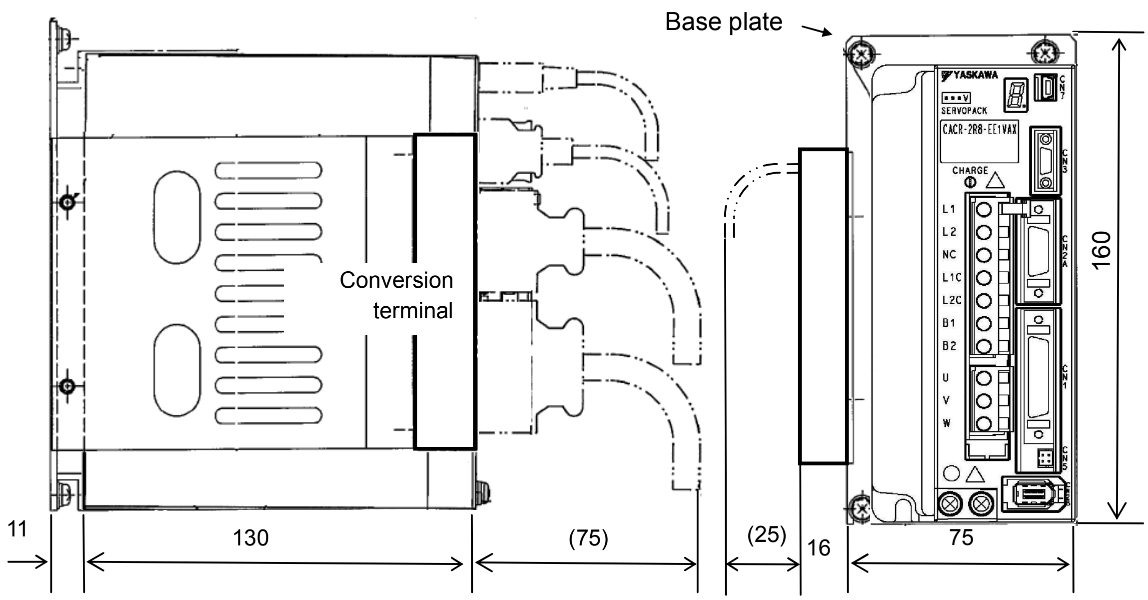
10.2.2. Replacement for SGDA 100V 200W, 200V 400W

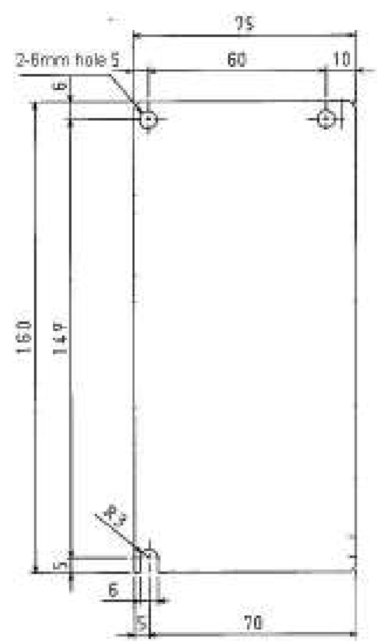
■Applied EGSV3
- CACR-2R8-EE2VAS-00
- CACR-2R8-EE1VAS-00
- CACR-2R8-EE2VAP-00
- CACR-2R8-EE1VAP-00

■Dimensions

Σ-I size [W75 H160 D130]→ EGSV3 with attachment [W91 H160 D141]

*Dimensions of Width (W) and depth (D) is not included Connector and cable assembling
Additional dimensions for connector and cable assembling is 25mm as width and 75mm as depth.





10.2.3. Replacement for SGDA 100V 300W, 200V 750W

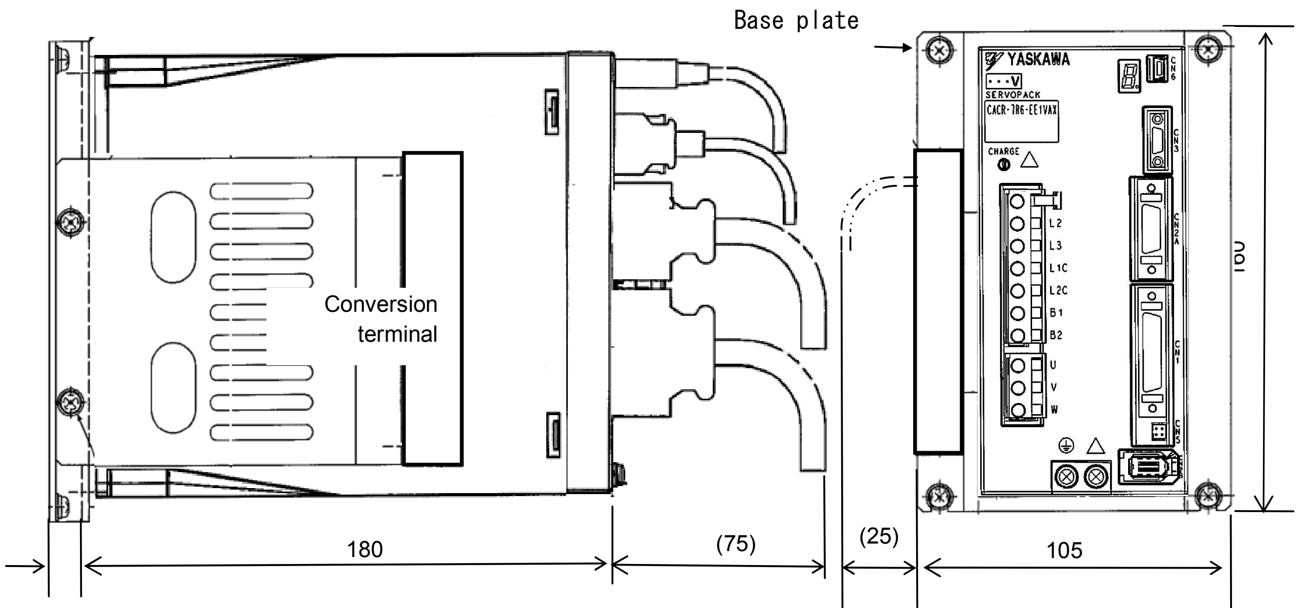
■Applied EGSV3

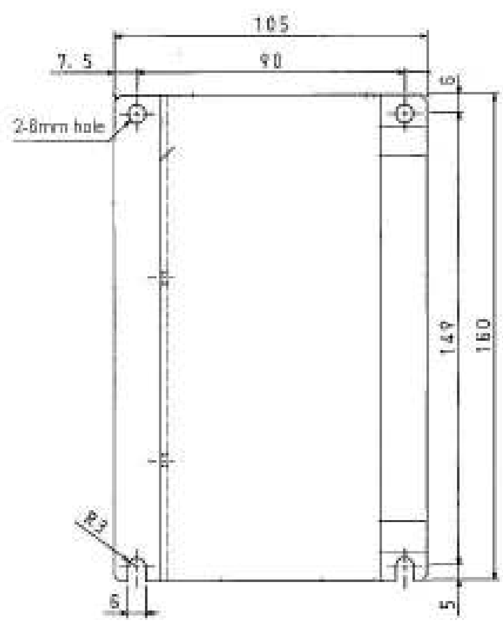
CACR-5R5-EE2VAS-00
CACR-5R5-EE1VAS-00
CACR-5R5-EE2VAP-00
CACR-5R5-EE1VAP-00

■Dimensions

Σ-I size [W105 H160 D130]→ EGSV3 with attachment [W105 H160 D193.5]

*Dimensions of Width (W) and depth (D) is not included Connector and cable assembling
Additional dimensions for connector and cable assembling is 25mm as width and 75mm as depth.

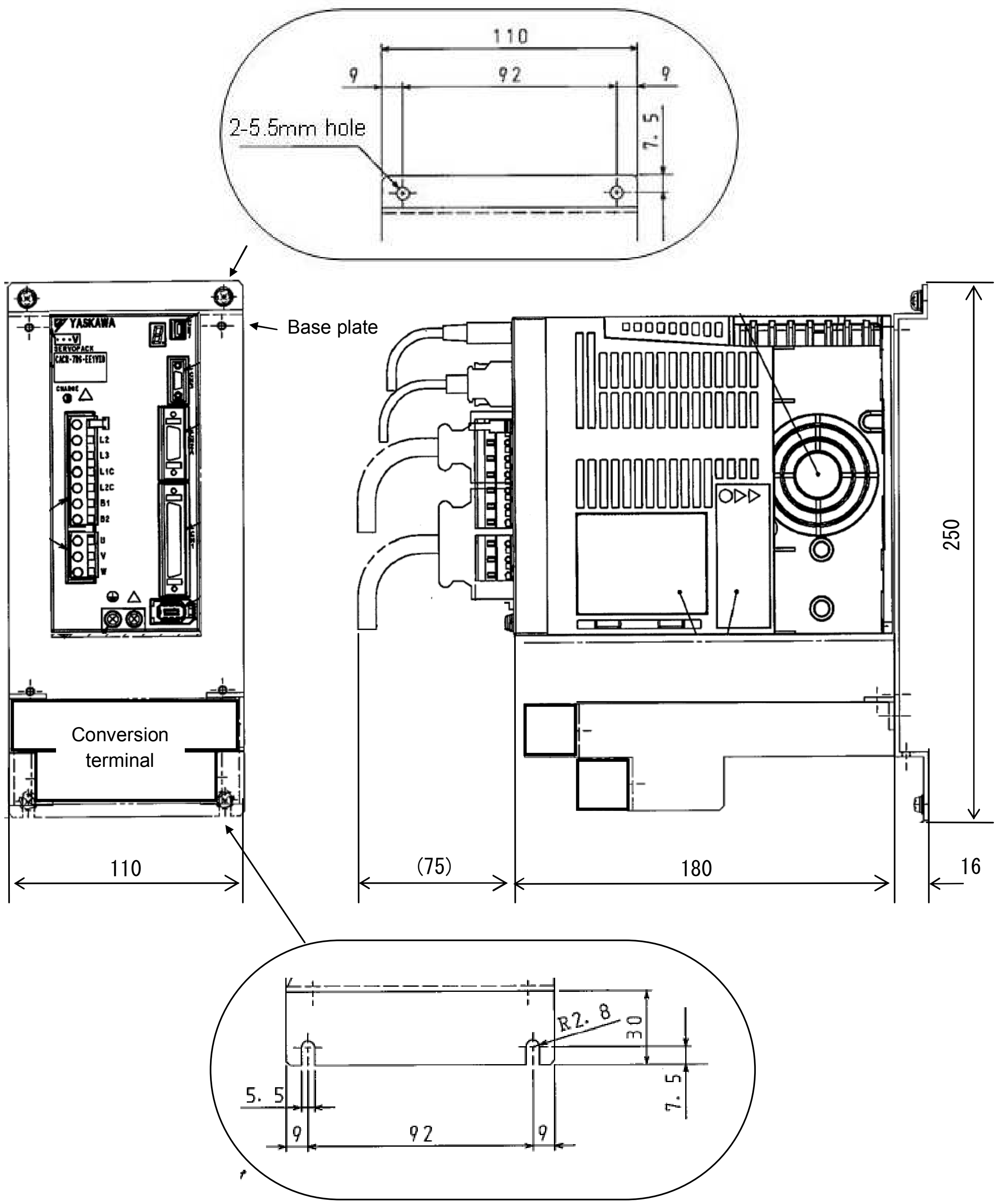




10.2.4. Replacement for SGDB 500W, 1kW

■Applied EGSV3
CACR-3R8-EE1VBD-00
CACR-7R6-EE1VBD-00

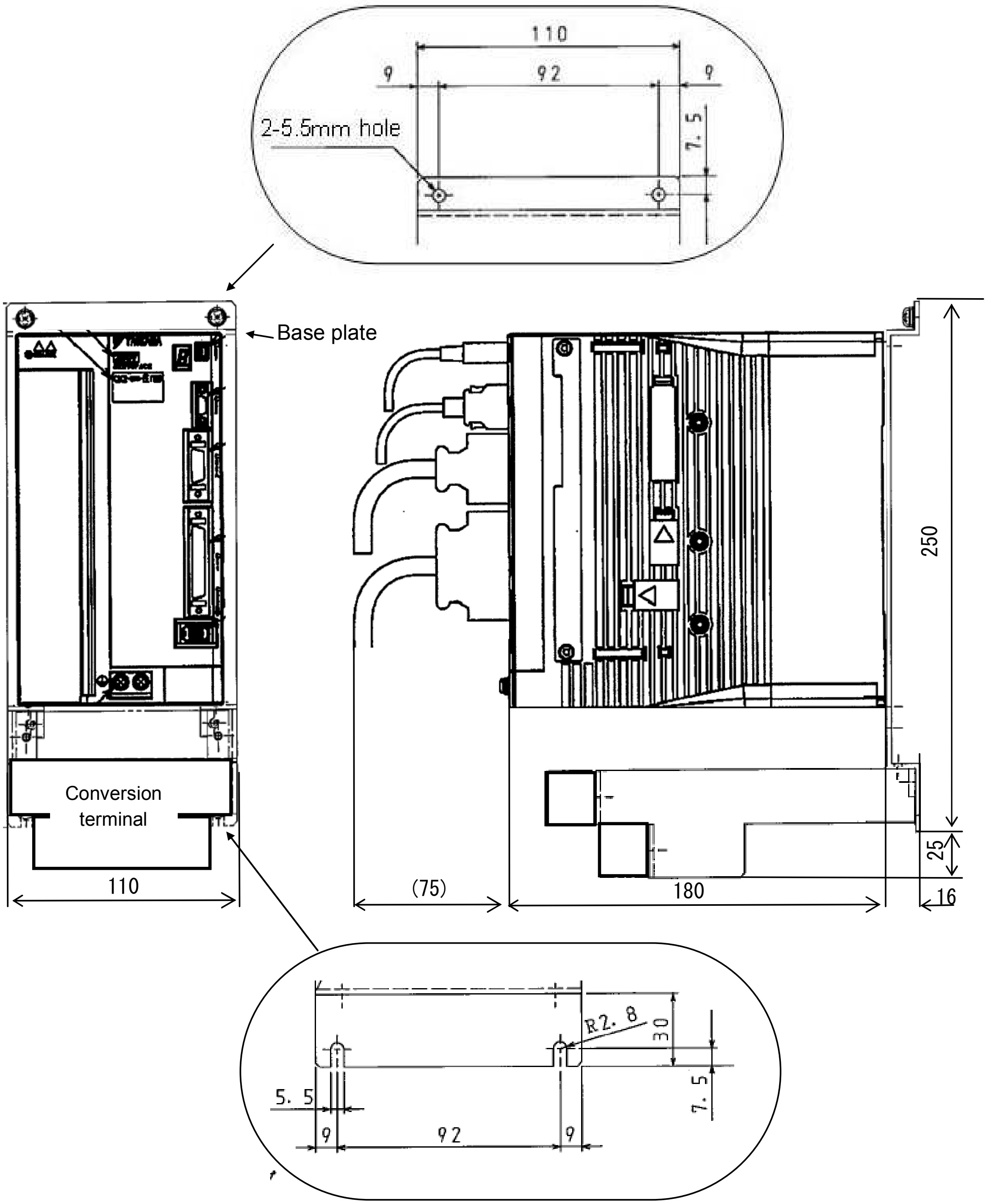
■Dimensions
Σ-I size [W110 H250 D225]→ EGSV3 with attachment [W110 H250 D196]
* Connector and cable assembling size (75mm) is not included Depth (D).



10.2.5. Replacement for SGDB 1.5kW

■Applied EGSV3
CACR-120-EE1VBD-00

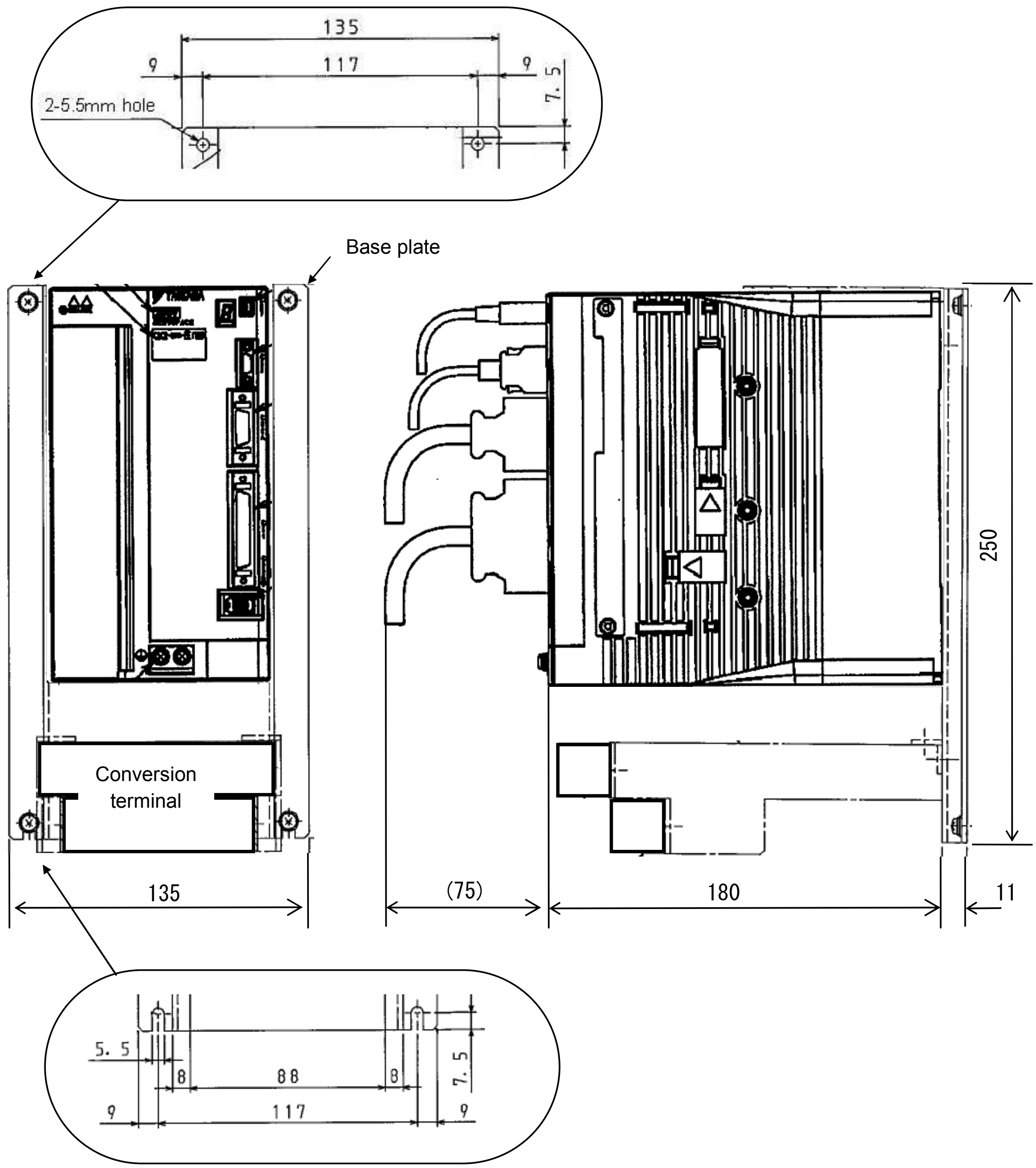
■Dimensions
Σ-I size [W110 H250 D225]→ EGSV3 with attachment [W110 H270 D196]
* Connector and cable assembling size (75mm) is not included Depth (D).



10.2.6. Replacement for SGDB 2kW, 3kW

■Applied EGSV3
CACR-180-EE1VBD-00
CACR-240-EE1VBD-00

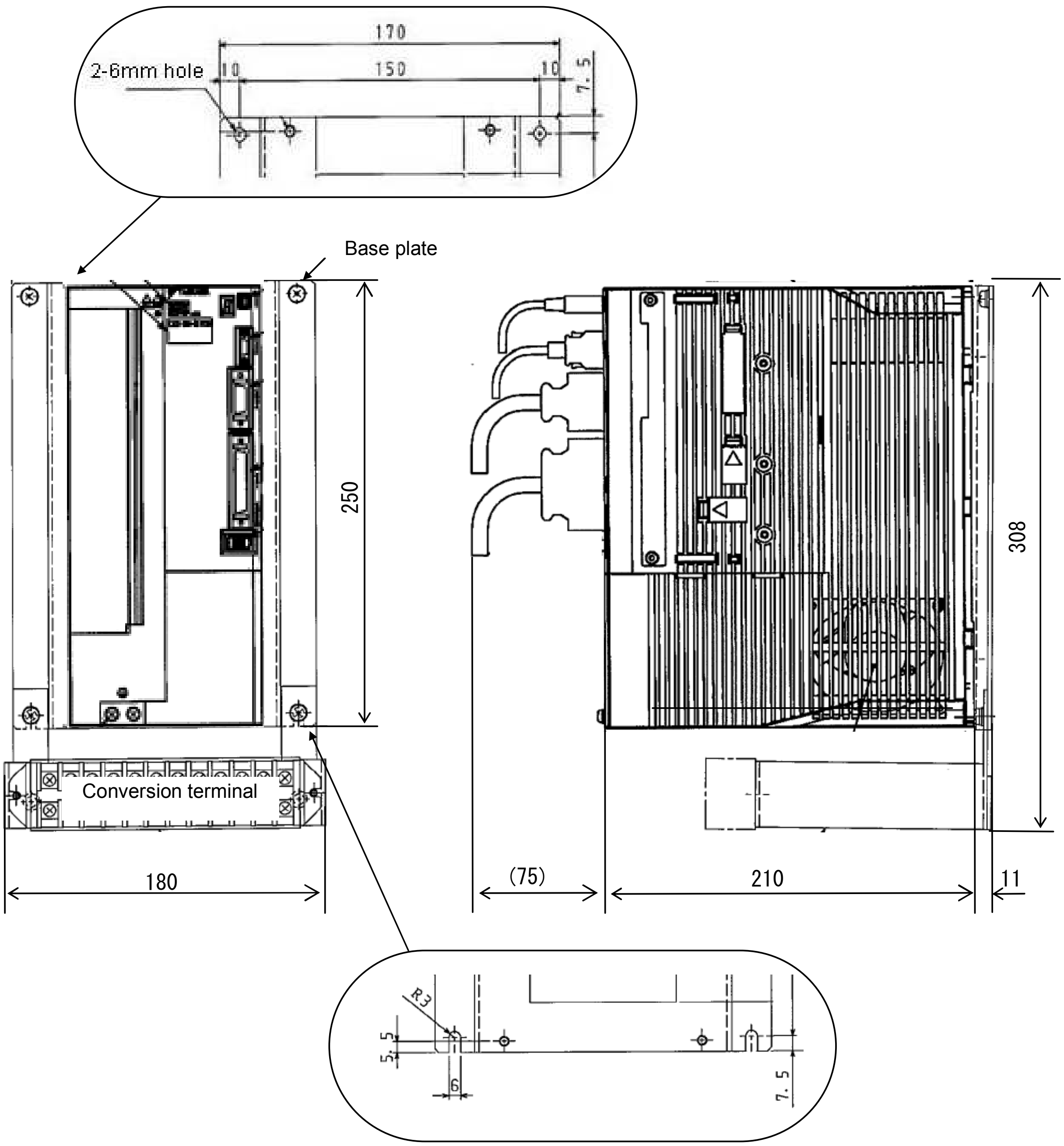
■Dimensions
Σ-I size [W130 H250 D225]→ EGSV3 with attachment [W135 H250 D191]
* Connector and cable assembling size (75mm) is not included Depth (D).



10.2.7. Replacement for SGDB 4.4kW, 5kW

■Applied EGSV3
CACR-330-EE1VBD-00

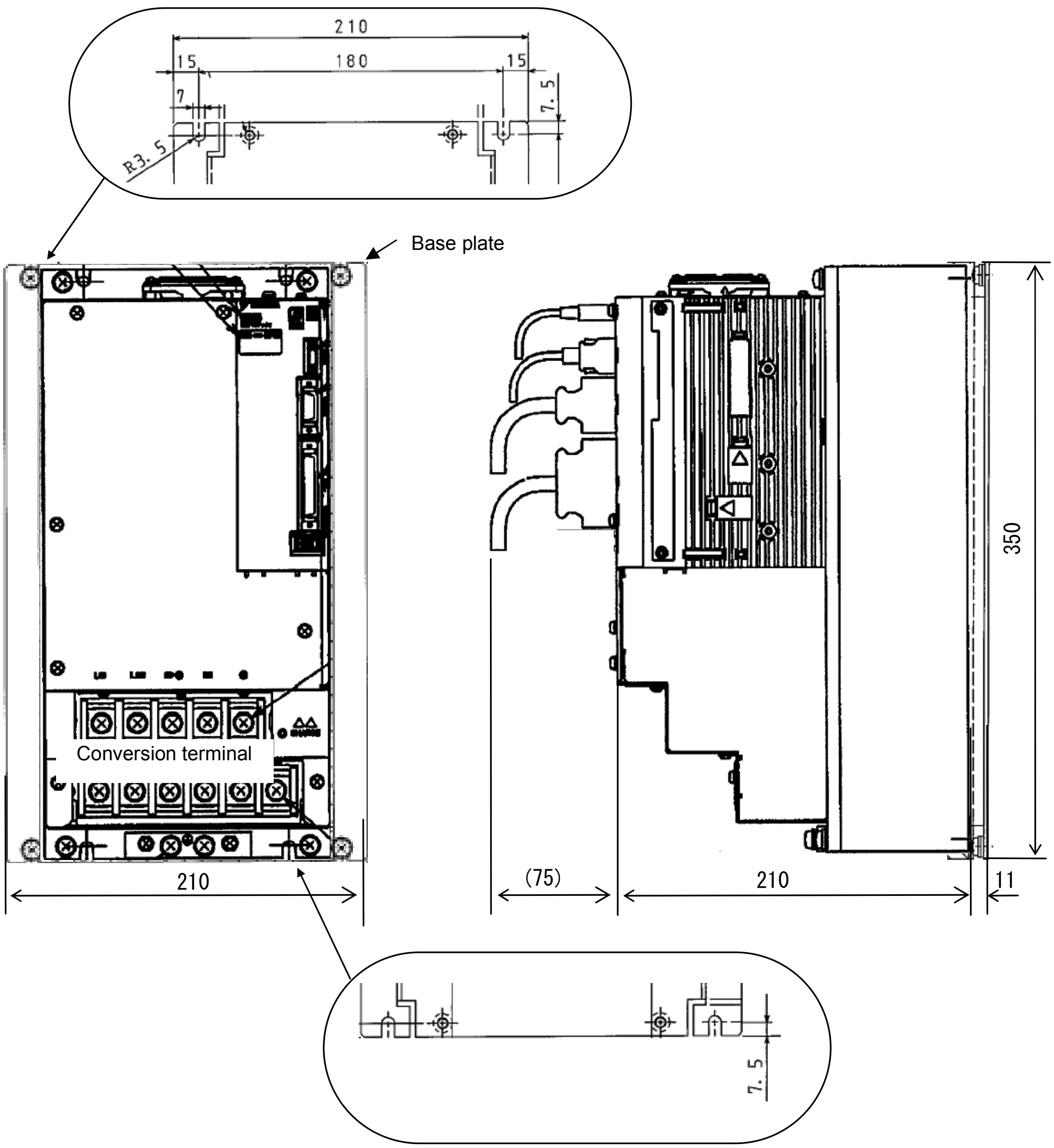
■Dimensions
Σ-I size [W210 H250 D225]→ EGSV3 with attachment [W180 H308 D221]
* Connector and cable assembling size (75mm) is not included Depth (D).



10.2.8. Replacement for SGDB 6kW, 7.5kW

■Applied EGSV3
CACR-470-EE1VBD-00
CACR-550-EE1VBD-00

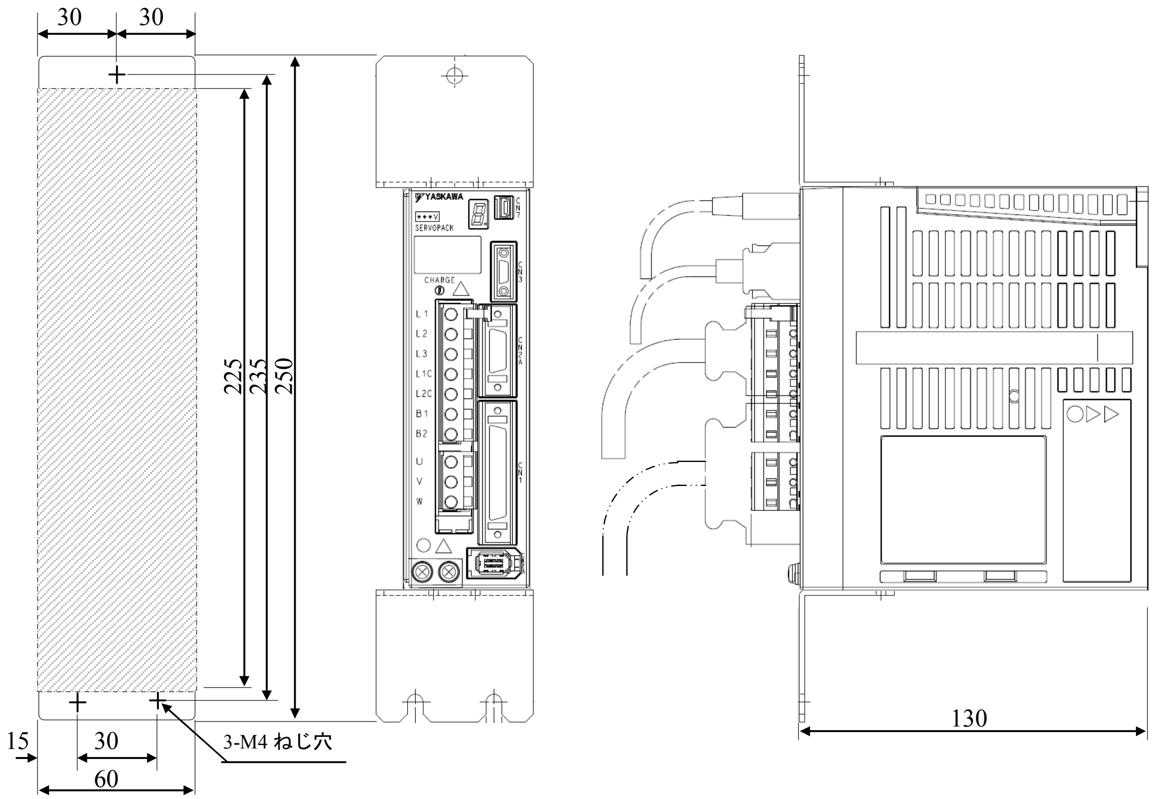
■Dimensions
Σ-I size [W230 H350 D240]→ EGSV3 with attachment [W210 H350 D221]
* Connector and cable assembling size (75mm) is not included Depth (D).



10.2.9. For DR2-A3～01AC、DR2-A3～A5BC

CACR-R44-EE1VBD-00	CACR-R70-EE2VBD-00
CACR-R70-EE1VBD-00	CACR-R90-EE2VBD-00
CACR-R90-EE1VBD-00	CACR-2R1-EE2VBD-00
CACR-2R1-EE1VBD-00	

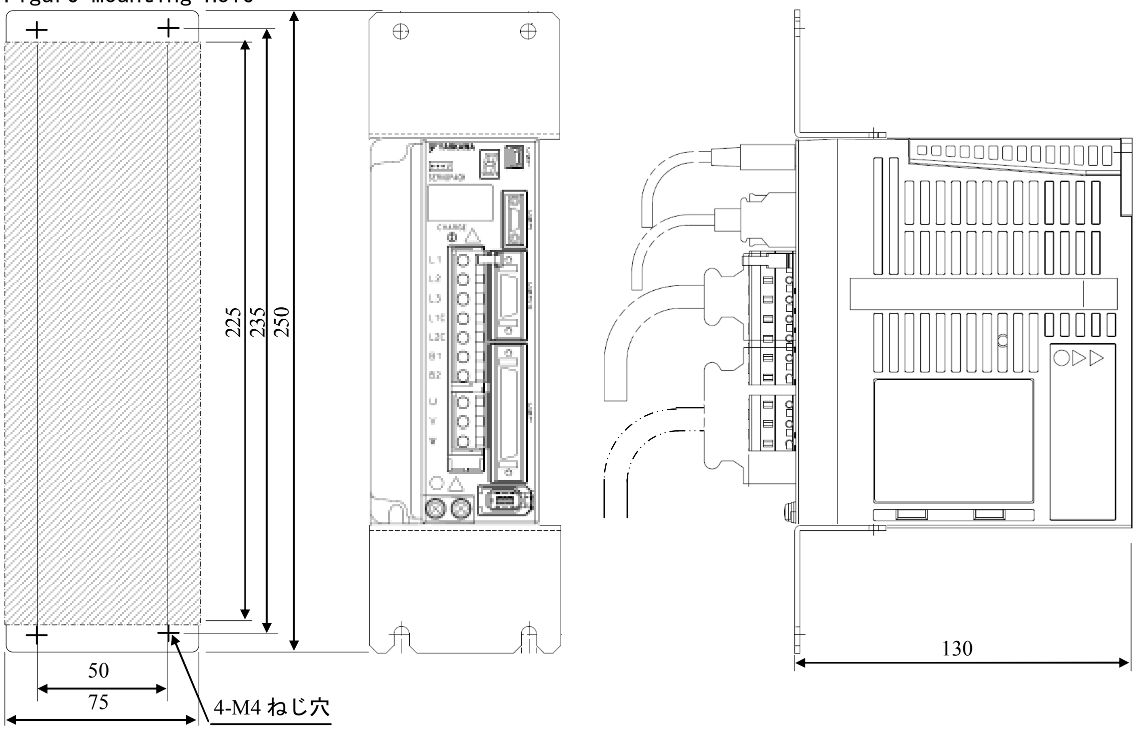
Figure Mounting Hole



10.2.10. For DR2-04AC、DR2-02BC

CACR-2R8-EE1VBD-00　CACR-2R8-EE2VBD-00

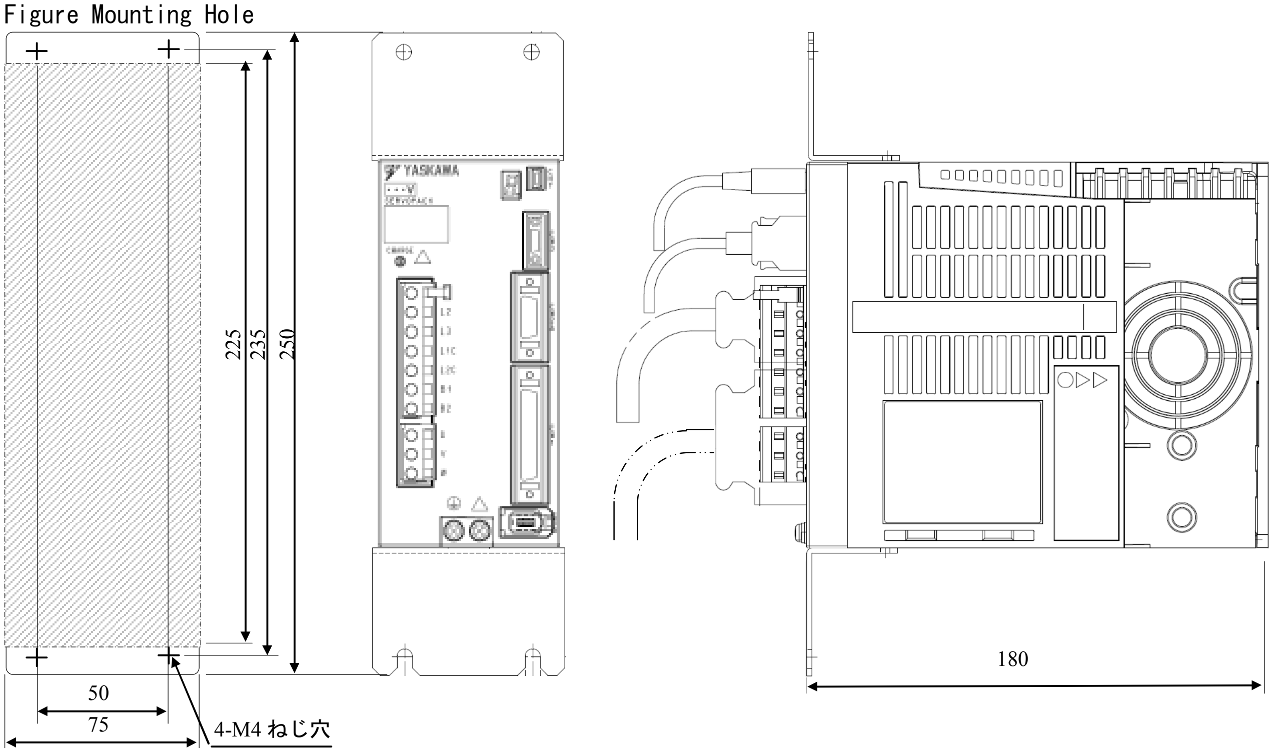
Figure Mounting Hole



10.2.11. For DR2-08AC、DR2-03BC

CACR-5R5-EE1VBD-00　CACR-5R5-EE2VBD-00

Figure Mounting Hole

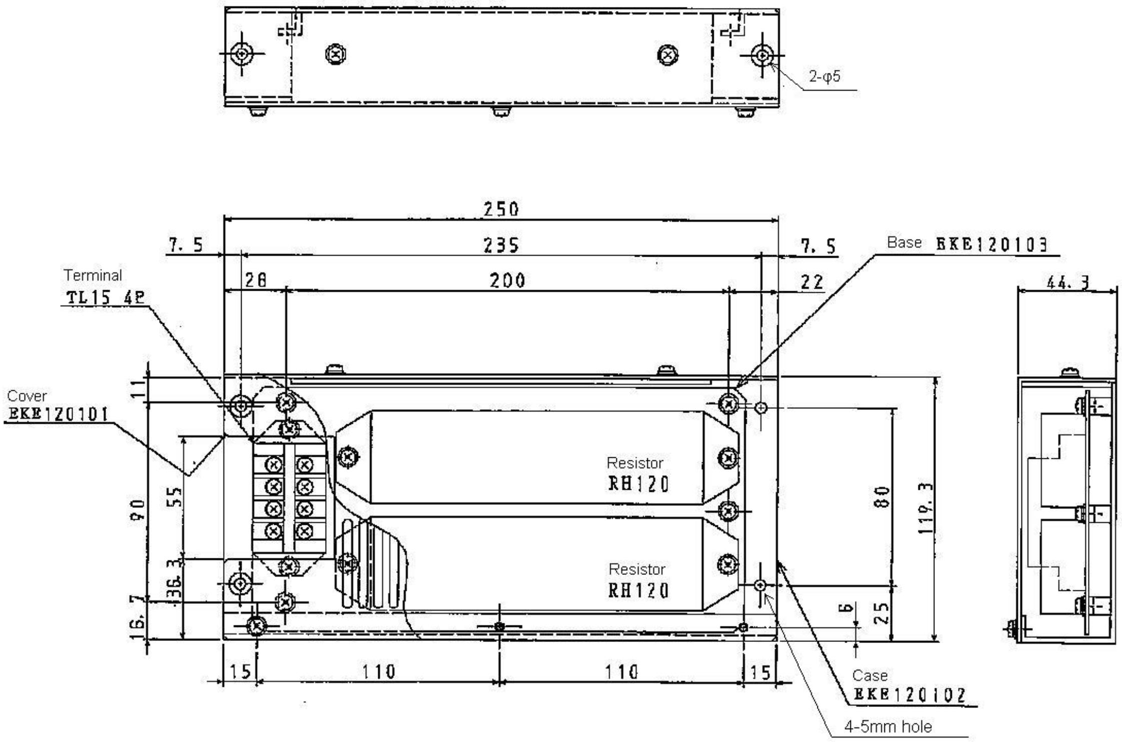


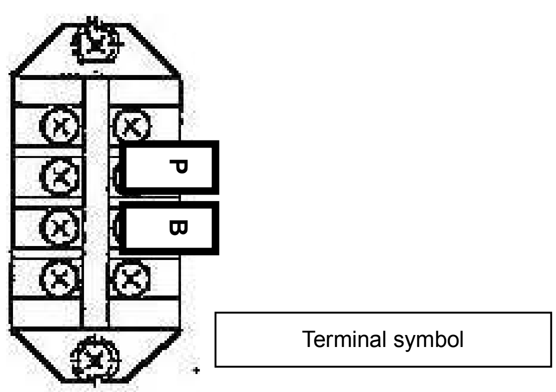
10.3. External Regenerative Resistor

10.3.1. EGDR-R01、EGDR-R02 external dimensions

■Specification

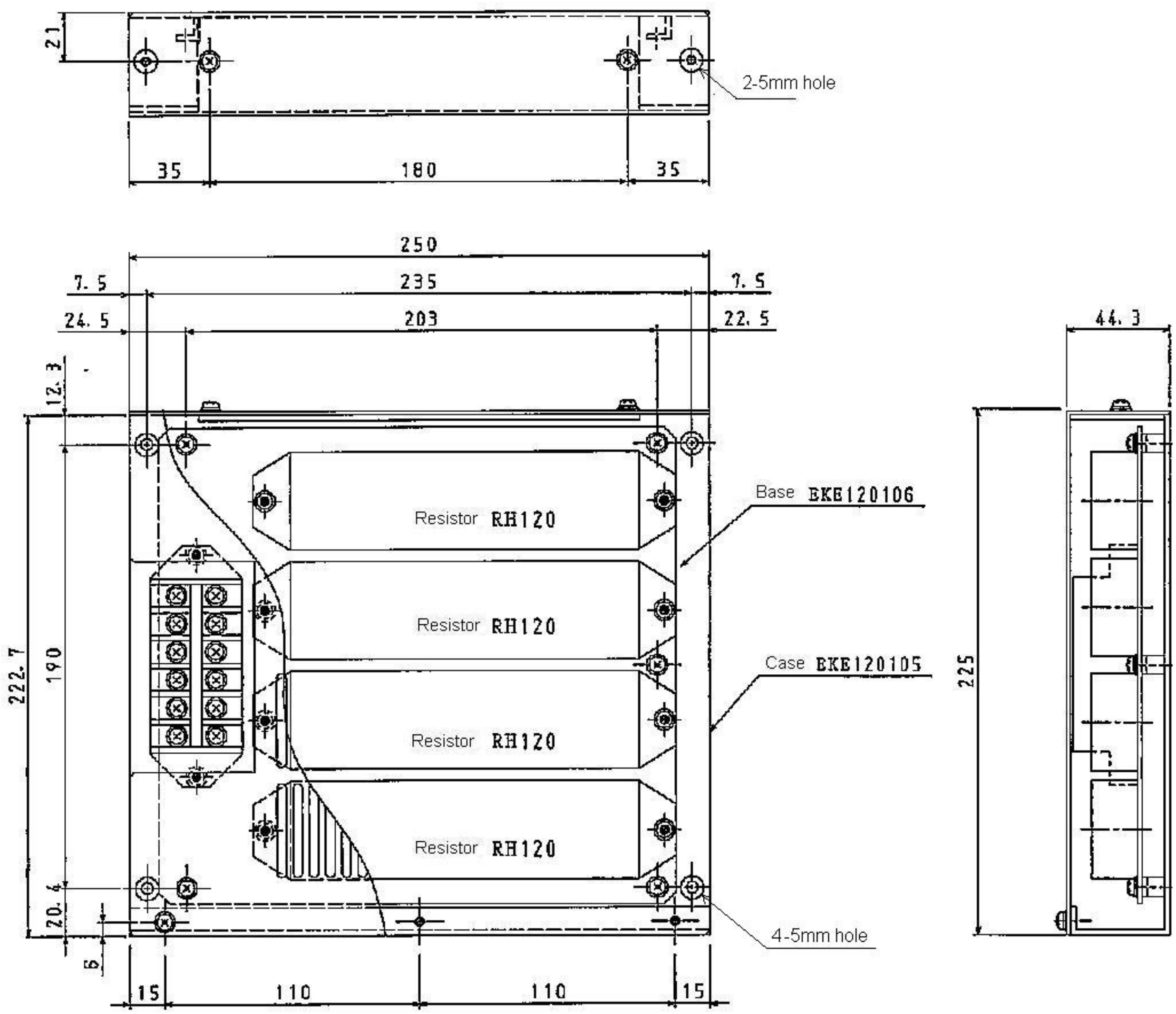
EGDR-R01　140W, 50Ω
EGDR-R02　140W, 12.5Ω

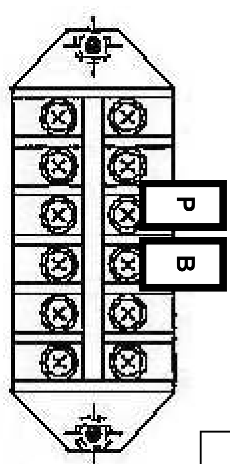




10.3.2. EGDR-R03 External Dimensions

■Specification
EGDR-R03　280W, 8Ω

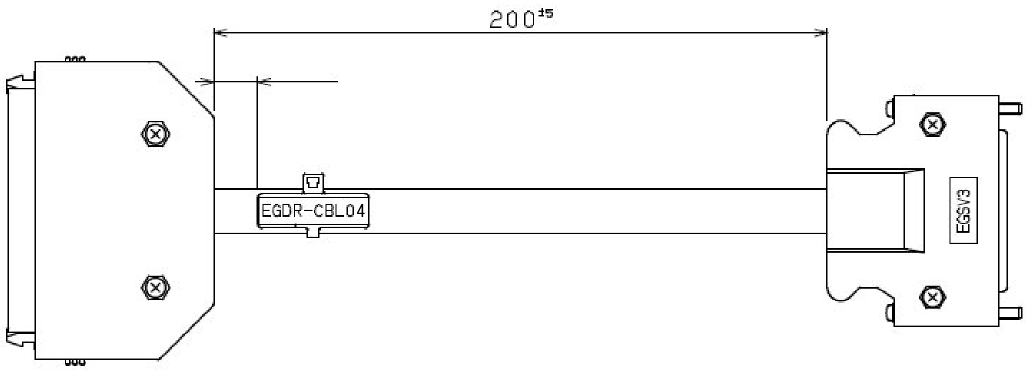




Terminal symbol

10.4. Connector 1 conversion cable for DR2 EGDR-CBL04

10.4.1. Drawings



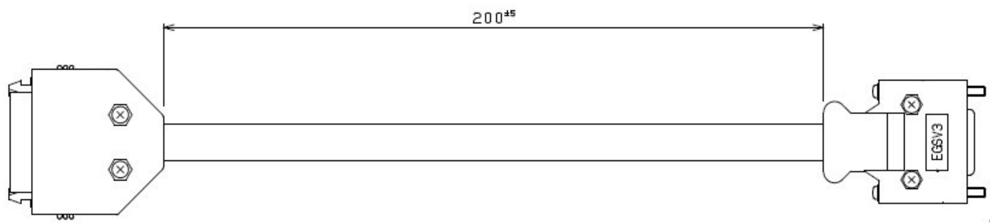
10.4.2. Schematic

	DR2		EGSV3
1	SG	1	SG
2	SG	2	SG
3	PL1	3	PL1
4	SEN	4	SEN
5	V-REF	5	V-REF
6	SG	6	SG
7	PULS	7	PULS
8	/PULS	8	/PULS
9	T-REF	9	T-REF
10	SG	10	SG
11	SIGN	11	SIGN
12	/SIGN	12	/SIGN
13	PL2	13	PL2
14	/CLR	14	/CLR
15	CLR	15	CLR
16	MON1	16	MON1
17	MON2	17	MON2
18	PL3	18	PL3
19	PCO	19	PCO
20	/PCO	20	/PCO
21	BAT+	21	BAT+
22	BAT-	22	BAT-
23	12V	23	12V
24	-12V	24	-12V

25	CLT	25	CLT
26	/CLT	26	/CLT
27	TGON+	27	TGON+
28	TGON-	28	TGON-
29	S-RDY+	29	S-RDY+
30	S-RDY-	30	S-RDY-
31	ALM+	31	ALM+
32	ALM-	32	ALM-
33	PAO	33	PAO
34	/PAO	34	/PAO
35	PBO	35	PBO
36	/PBO	36	/PBO
37	AL01	37	AL01
38	AL02	38	AL02
39	AL03	39	AL03
40	/S-ON	40	/S-ON
41	/P-CON	41	/P-CON
42	P-OT	42	P-OT
43	N-OT	43	N-OT
44	/ALM-RST	44	/ALM-RST
45	/P-CL	45	/P-CL
46	/N-CL	46	/N-CL
47	24Vin	47	24Vin
48	PSO	48	PSO
49	/PSO	49	/PSO
50	FG	50	FG

10.5. Connector 2 conversion cable for Encoder EGDR-CBL05

10.5.1. Drawings



10.5.2. Schematic

	ｴﾝｺｰﾀﾞ		EGSV3
1	SG	1	SG
2	SG	2	SG
3	SG	3	SG
4	PG5V	4	PG5V
5	PG5V	5	PG5V
6	PG5V	6	PG5V
7	DIR	7	DIR
8	PU	8	PU
9	/PU	9	/PU
10	PV	10	PV
11	/PV	11	/PV
12	PW	12	PW
13	/PW	13	/PW
14	PC	14	PC
15	/PC	15	/PC
16	PA	16	PA
17	/PA	17	/PA
18	PB	18	PB
19	/PB	19	/PB
20	FG	20	FG

11. Appendix

11.1. About Difference between EGSV3 and Σ-V

EGSV3 SERVOPACK basically applies standard Σ-V technology. But some points are different. Typical different points and common points are as shown below.

Common point

Item	Content	Note
Digital operator	Connection is possible.	
SigmaWin＋	Connection is possible. （Sigma Win + does not support some function of EGSV3.）	

Different point

Item	Content	Note
Option module for Σ-V	No support on EGSV3	
Mechatrolink connection	No support on EGSV3	
Panel operator	No support on EGSV3	
Σ-V safety function	No support on EGSV3	
AC100V model	100V model of EGSV3 can connect 100V model of motor. But 100V model of Σ-V SERVOPACKs connects to 200V model of motor due to apply the double voltage system on main circuit.	

11.2. Σ-V Series Related Documents

Σ-V series related documents for EGSV3 are as shown below.
Refer to these manuals as required.

Document name	Selecting Models and Peripheral Devices	System Design	Panels and Wiring	Trial Operation	Trial Operation and Servo Adjustment	Maintenance and Inspection
S-V Series User's Manual Design and Maintenance Rotational Motor/ Analog Voltage and Pulse Train Reference (SIEP S0000045)		x	x		x	x
S-V Series User's Manual Operation of Digital Operator (SIEP S800000 55)				x	x	x
AC SERVOPACK SGDV Safety Precautions Model:CACR-xxx-EE (GS-11-107)	x		x			x
S Series Digital Operator Safety Precautions (TOBP C730800 00)						x

11.3. About Difference between EGSV3 and Σ-I

EGSV3 makes a point of compatibility as substitute Σ-I SERVOPACK. However some specifications are different. Typical different points are explained below.

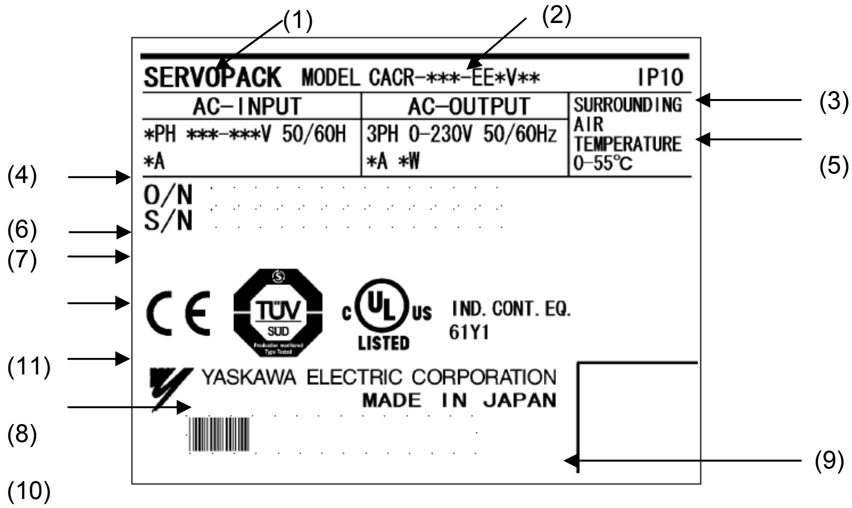
Item	Detail	Note
Auto tuning function	Same level of Σ-I auto tuning function is not supported. It's more like Σ-V.	
Speed bias function	EGSV3 does not support the speed bias function. Field engineer in Yaskawa Engineering adjust it as needed	
Separation between control power and main power	In SGDA, control power supply and main power supply is on common terminal. But the each power input of EGSV3 is separated. Conversion terminal for EGSV3 is useful for substitution.	
External Regenerative resistor unit	EGSV3 is included the regenerative transistor. Regenerative unit for SGDA is not usable. EGDR-R01 is prepared as External Regenerative Resistor unit for EGSV3.	
Model of I/O connector and encoder connector for DR2	I/O connector and encoder connector on EGSV3 is not compatible with DR2. It's not usable with the existing cable and connector. Use conversion cables. I/O connector and encoder connector on EGSV3 is compatible with SGDA and SGDB. It's usable with the existing cable and connector	
Mounting dimension External dimension	Refer the next chapter 11.3.1	

11.3.1. Comparison Mounting Dimension and External Dimensions

Group	Old model	External Dimensions			EGSV3	EGSV3			Attachment with EGSV3			Attachment and Base with EGSV3		
		W	H	D		W	H	D	W	H	D	W	H	D
SGDA Speed 100v	SGDA-A3BS	55	160	130	CACR-R70-EE2VAS-00	47	150	130	55	160	141	71	160	141
	SGDA-A5BS				CACR-R90-EE2VAS-00									
	SGDA-01BS				CACR-2R1-EE2VAS-00									
	SGDA-02BS	75	160	130	CACR-2R8-EE2VAS-00	65	150	130	75	160	141	91	160	141
	SGDA-03BS	105	160	130	CACR-5R5-EE2VAS-00	70	150	180	105	160	193.5	105	160	193.5
SGDA Speed 200v	SGDA-A3AS	55	160	130	CACR-R44-EE1VAS-00	47	150	130	55	160	141	71	160	141
	SGDA-A5AS				CACR-R70-EE1VAS-00									
	SGDA-01AS				CACR-R90-EE1VAS-00									
	SGDA-02AS				CACR-2R1-EE1VAS-00									
	SGDA-04AS	75	160	130	CACR-2R8-EE1VAS-00	65	150	130	75	160	141	91	160	141
	SGDA-08AS	105	160	130	CACR-5R5-EE1VAS-00	70	150	180	105	160	193.5	105	160	193.5
SGDA Positioning 100v	SGDA-A3BP	55	160	130	CACR-R70-EE2VAP-00	47	150	130	55	160	141	71	160	141
	SGDA-A5BP				CACR-R90-EE2VAP-00									
	SGDA-01BP				CACR-2R1-EE2VAP-00									
	SGDA-02BP	75	160	130	CACR-2R8-EE2VAP-00	65	150	130	75	160	141	91	160	141
	SGDA-03BP	105	160	130	CACR-5R5-EE2VAP-00	70	150	180	105	160	193.5	105	160	193.5
SGDA Positioning 200v	SGDA-A3AP	55	160	130	CACR-R44-EE1VAP-00	47	150	130	55	160	141	71	160	141
	SGDA-A5AP				CACR-R70-EE1VAP-00									
	SGDA-01AP				CACR-R90-EE1VAP-00									
	SGDA-02AP				CACR-2R1-EE1VAP-00									
	SGDA-04AP	75	160	130	CACR-2R8-EE1VAP-00	65	150	130	75	160	141	91	160	141
	SGDA-08AP	105	160	130	CACR-5R5-EE1VAP-00	70	150	180	105	160	193.5	105	160	193.5
DR2 Speed Positioning 100v	DR2-A3BC	60	220	201	CACR-R70-EE2VBD-00	47	150	130	60	220	130	No Option		
	DR2-A5BC				CACR-R90-EE2VBD-00									
	DR2-01BC				CACR-2R1-EE2VBD-00									
	DR2-02BC	75	220	249	CACR-2R8-EE2VBD-00	65	150	130	75	220	130			
	DR2-03BC				CACR-5R5-EE2VBD-00				75	220	180			
DR2 Speed Positioning 200v	DR2-A3AC	60	220	201	CACR-R44-EE1VBD-00	47	150	130	60	220	130			
	DR2-A5AC				CACR-R70-EE1VBD-00									
	DR2-01AC				CACR-R90-EE1VBD-00									
	DR2-02AC				CACR-2R1-EE1VBD-00									
	DR2-04AC	75	220	249	CACR-2R8-EE1VBD-00	65	150	130	75	220	130			
	DR2-08AC				CACR-5R5-EE1VBD-00	70	150	180	75	220	180			
SGDB standard	SGDB-03ADM	110	250	225	CACR-3R8-EE1VBD-00				110	250	196	110	250	196
	SGDB-05AD*													
	SGDB-07ADM				CACR-7R6-EE1VBD-00									
	SGDB-10AD*													
	SGDB-15AD*				CACR-120-EE1VBD-00	100	180	180				110	275	196
	SGDB-20AD*	135	250	225	CACR-180-EE1VBD-00				135	250	191	135	250	191
	SGDB-30AD*				CACR-240-EE1VBD-00									
	SGDB-44AD*	210	250	255	CACR-330-EE1VBD-00	110	250	210	180	250	221	180	308	221
	SGDB-50AD*													
	SGDB-60AD*	230	350	240	CACR-470-EE1VBD-00	170	350	210	210	350	221	—	—	—
	SGDB-75ADG				CACR-550-EE1VBD-00							—	—	—
	SGDB-1AADG	260	450	265	CACR-660-EE1VBD-00	260	450	274	—	—	—	—	—	—
	SGDB-1EADG				CACR-780-EE1VBD-00							—	—	—
External dimensions						Not compatible			Some case, depth is longer than original			Some case, width is longer than original		
mounting dimensions						Not compatible			compatible					
I/O connection to upper controller						Compatible (not compatible with DR2)								
Encoder wiring						compatible (not compatible with DR2)								
Main power wiring						Not compatible(compatible with 11,15kW)						compatible		

11.4. Name Plate

11.4.1. Standard Name Plate



Indication	
(1)	Name of product
(2)	Model
(3)	Protection Class
(4)	Power specification
(5)	Surrounding Air Temperature
(6)	Ordering Number
(7)	Serial number
(8)	Company name
(9)	Country of manufacturer
(10)	Bar code
(11)	Applicable Standards

11.5. Spec. code NP

Spec. Code NP is a nameplate to distinguish the motor parameter setting..
M1 is to show the No.1 motor model, and M2 is to show the No.2 motor model.



M1,M2 : [standard] means the motor model on chapter 6.3.
Motor model except chapter 6.3 is to indicate the following table.

①②③ ④⑤ ⑥

①②③ → motor series

④⑤ → capacity

⑥ → encoder

motor series

Code	Type	series
SGM	SGM,SGME,SGML	Σ I
SGP	SGMP	Σ I
SGA	SGMG-□A	Σ I
SGB	SGMG-□B	Σ I
SGS	SGMS	Σ I
SGD	SGMD	Σ I
UAR	USAREM	USA
UAP	USAPEM	USA
UAH	USAHEM	USA
UAM	USAMED	USA
UAF	USAFED	USA
UGA	USAGED-□A	USA
UGB	USAGED-□B	USA
UAS	USASEM	USA
UAD	USADED	USA

capacity

Code	capacity
A3	30W
A5	50W
A8	80W
01	100W
02	200W
03	300W
04	400W
05	500W
06	600W
07	700W
08	800W
09	900W
10	1.0kW
12	1.2kW
13	1.3kW
15	1.5kW
20	2.0kW
22	2.2kW
30	3.0kW
32	3.2kW
37	3.7kW
40	4.0kW
44	4.4kW
50	5.0kW
55	5.5kW
60	6.0kW
75	7.5kW
1A	11kW
1E	15kW

encoder

Code	pulse	
F	Conventional incremental	1000
H	Conventional incremental	1440
E	Conventional incremental	1500
K	Conventional incremental	2000
C	Conventional incremental	2500
D	Conventional incremental	4000
B	Conventional incremental	5000
A	Conventional incremental	6000
M	Conventional incremental	30000
F	Multiplexed incremental	1024
3	Multiplexed incremental	2048
4	Multiplexed incremental	2500
6	Multiplexed incremental	4096
2	Multiplexed incremental	8192
W	ABSO	1024
S	ABSO	8192

12. Revision history

Revision No.	Δ	Revised date	Revised content	Revised page
1st	--	2011/6/26	—	—
2nd	(2)	2012/7/23	Correction of errors in regenerative resistor of 3kW Addition of minimum allowable regenerative resistance	P8 P8
3rd	(3)	2012/11/09	1.3.1., 1.3.2. rv 2R1 Approx. Mass 1.2kg → 1.0kg 1.3.4. Correction of errors in photo coupler output max. current 10mA → 50mA 6.1. Pn000.3rd =3 additional setting =3 : Output Pulses Function Automatically Select setting range 0000-02B3 → 0000-03B3 factory setting 0200→0300 or 0310 supported in more than Ver. xxA5xx Pn232.1st=2 additional setting setting range 0100-0101 → 0101-0102 supported in more than Ver. xxA5xx 6.3. Spec. changes supported in more than Ver. xxxxA5 3R8-EE1VBD motor parm2 SGMG-05A*A→SGM-04A 470-EE1BVD motor parm2 SGMG-55A*A→SGMG-60A*B 7.2.1. Correction of the description of alarm A.C20 : Phase detect error → Phase error at the power turned on A.C21 : Phase error → Phase error at the the operating 10.2.1. Addition of the missing type -EExVAP	P9 P10 P31 P33 P37 P39 P44
4th	(4)	2013/1/31	6.2. Correction of errors PnE20.1,0 or PnE40.1,0 → PnF20.1,0 or PnF40.1,0 11.5. Addition of power 80W and encoder code inclusion of SGME, SGML into motor code SGM	P36 P58
5th	(5)	2013/3/5	3. Addition DR2's attachment 10.2.9.～10.2.11. Addition of the drawings for DR2 update 10.4. Addition of Connector 1 conversion cable 10.5. Addition of Connector 2 conversion cable 11.3. Description of DR2's conversion cable 11.3.1. Addition of dimensions for DR2 update 11.5. Correction of errors Encoder code 4096P/R 7 → 6	P12 P52,53 P56 P57 P59 P60 P62

Reengineered AC SERVOPACK
EGSV3 Series CACR-***-EE*V**-00
User's Manual

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